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DOMINION OF CANADA—DEPARTMENT OF AGRICULTURE

An Economic Study of Land Utilization in Southern Alberta

G. H. Craig and J. Coke

MARKETING SERVICE
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FOREWORD

THE prairie region of Southern Alberta is one of great variation in annual precipitation. Extremes of climate have been the rule since settlement and have resulted in agriculture of an unstable and changing nature. For this reason farmers have found great difficulty in establishing a satisfactory system of farming or a suitable utilization of land.

The speed with which settlement occurred in the prairie region was in itself sufficient evidence of possible future difficulties. The hope and promise of new land turned out many times to be a mirage of unfounded optimism. Many settlers of the period of rapid expansion, in the decade after the turn of the century, moved from one discouraging farm to another, gradually pushing northward, each time starting out on the enterprise with a little less in initial capital, a little less in health of body and mind, and often with an increase in the number in the family. It was this family of the wandering settler that paid the greatest price of rapid settlement. But the country as a whole has paid. Assistance in the form of relief and subsidized local improvements came directly out of public funds; and it has continued to be as great a problem as it was after the first wave of settlement.

With settlement still continuing on lands of dubious productivity it seems pertinent to ask the question: "Under what conditions have settlements reached the state of maturity and independence of outside help?" It was as a partial answer to this question that the study was made. A thorough scrutiny of the settlement process and various indexes of success will be tested and evaluated as criteria upon which future land use and settlement policy may be based.

The drought area, the focus of this study, is a region of risk and uncertainty. The extremes of climate are found there, and so also are the extremes of the general business changes. It is essentially a specialized area in its agricultural production. Naturally, then, its welfare ebbs and flows with the vagaries of precipitation and the price of wheat, and to a limited extent, of livestock. The prices of these two commodities, especially the former, are among the most fluctuating, and with the choice of other farm enterprises strictly limited, the full force of the fluctuating wheat price is felt. With the oscillations of the climate and the business cycle come the very fat and the very lean years. There is seldom a normal year. The importance of the risk factor cannot be over emphasized as contributing to a complete understanding of agriculture in the dry area.

Farming in this area has been a continuation of the pioneering period of Western Canada. The hope of making a fortune in farming was still found in the breasts of many of the dry area farmers. Of recent years continued drought and low prices discouraged many and drove them to less risky enterprises, but there still remained on some of the poorest soils and most eroded areas of the province a remnant of those who had tasted the fruits of prosperity, and who hoped to taste them again. It was probably not altogether an unfounded hope either. Single years may come again in which the conjuncture of wet seasons and high prices may again make Palliser's Triangle a land of relative prosperity. Such a condition would not solve the problem. It would be sufficient to revive the enthusiasm of those who are potential settlers of the area. It would bring again a wave of resettlement in the region. The inevitable result would be further privation and poverty—because, the dry area is one in which dry periods and low prices will always return. Its history in terms of years has been one of sub-marginal production in greater proportion than of supra-marginal production. It is because good years may return that

provision must be made for guiding settlement. With no chance of prosperous years, the problem would solve itself. Abandonment would become general and only those who could maintain themselves on a normal standard of living would remain. Therefore, since there is a body of people who are still potential settlers of this region, the far-seeing policy will be one which will set the stage for returning prosperity, so that when it comes it will not be followed by another period of extensive relief and difficulty such as has occurred in the past. Without some artificially introduced change, the drought area will never reach maturity; it will remain typically the risky pioneering venture that it has been during the past thirty years.

The recent extreme drought and the lowness of wheat prices has been so severe and prolonged that the burden upon government and the Canadian people generally has become important. No longer can the lot of the settler be considered the only factor. The cost to all tax-payers has made the problem a national one. The damage to soil and to capital investment is of sufficient magnitude that some are questioning the policy of allowing farming to continue in parts of the area at all. They see little chance of the area repaying even in small measure the relief and subsidies which have already gone into it. The possibility of building up reserves to take care of future lean years is not guaranteed even with changes in the use of land. However, the question has not yet been completely settled as to whether the so-called drought area is capable of producing a normal standard of living for its population, and if so in what parts and by what method of land use. This study aims to give partial answer to this question. An attempt will be made to evaluate the present type of land use in its income-producing aspect. It is interesting that even in the very poorest soil belts there were found farmers who lived comfortably on the land, but it was also true that many were in very straitened circumstances. Since the scope of the study is limited to a single section of the dry area, general inferences regarding the area as a whole are naturally limited.

The writers desire to acknowledge the assistance of J. Proskie, W. N. Watson, V. A. Wood and Wilmer J. Hansen, who co-operated in the field work and statistical analysis. E. N. Davidson and Hadley Van Vliet also assisted in collection of data in the field. Mr. Proskie was responsible for writing an original manuscript on Land Acquisition, Financial Progress and Indebtedness which has been freely used in this report. The section on Farm Abandonment was revised from an article by Mr. Watson in the Economic Annalist. Mr. Wood wrote the first draft of the section on Livestock. For these and other contributions the writers are greatly indebted. The co-operating agencies in the project were the Economics Division of the Marketing Service, Dominion Department of Agriculture, The Prairie Farm Rehabilitation Service, which provided the major financial assistance, the University of Alberta and the Alberta Department of Agriculture. Thanks are due in no small measure to the farmers who gave so willingly of their time when the numerators were in the field.

AN ECONOMIC STUDY OF LAND UTILIZATION IN SOUTHERN ALBERTA VULCAN-LOMOND AREA

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METHOD OF PROCEDURE AND SOURCES OF INFORMATION

A large part of the basic data for this study was drawn from a field survey. Detailed farm records were obtained from a sample of farm operators in the districts studied. The records included a complete physical inventory and description of the farm and all assets and liabilities of the operator at the time of settlement and in 1935; an estimate of crop acreages and yields in 1934 and in some cases of average annual yields for previous years; data covering cash receipts and expenditures for the year ending in July, 1935, and the products of the farm consumed by the farm family for the year. In addition, a record of outside sources of income since settlement, and personal data regarding the farm operator and his family were taken. All this information was obtained by enumerators who visited the farm during the summer of 1935. A total of 493 complete records were secured. Of these, 232 were obtained in the district henceforth to be called the Vulcan district; the remainder, or 261 records, came from farm operators in the Lomond district (Figure 1). These were approximately 32 per cent and 50 per cent respectively of the total number of farms. The sample may be considered quite representative of the immediate territory at least.

Information on soil, climate and physical features of the districts came chiefly from the Soil Map of the McLeod Sheet.[1] Much material on population and agriculture was obtained from the published census reports and from direct tabulations of the census material by the Dominion Bureau of Statistics. The municipal offices and departmental records in the Provincial Government were used to obtain data on taxation, municipal expenditures and relief.

THE APPROACH

Since the use of land in the Vulcan-Lomond area has been the focal interest of the study, some means of defining the land use was necessary, and the most useful definition was found to be that which measures the intensity of the use of land. By intensity is meant the relative amount of such factors as labour, machinery, live stock and management utilized on a specified land unit. Intensive farming is characterized by the use of relatively large amounts of productive factors on land; while extensive farming is characterized by the utilization of relatively smaller quantities. Emphasis has been placed on the adjustments which have occurred in the agriculture as judged by the intensity of the use of land.

At the time of first settlement farms were of almost equal size and the use of capital, equipment and labour on each farm varied little from district to district. However, the growing knowledge of the conditions of accessibility,

[1] "Soil Survey of HcLeod Sheet"—F. A. Wyatt and J. D. Newton, Universty of Alberta, Ext. Bull. No. 11, Sept. 1925.

soil, topography, precipitation, insect pestilence and the like, established a reorganization of the farms according to the physical limits of each specific area. It was noticeable for instance, that the average total area of the farm increased from the heavier to the lighter rainfall belts, proceeding from the western side of the Vulcan district to the eastern side of Lomond. Typically the Vulcan farms have greater numbers of animals that use concentrated feeds while the Lomond farms contain more of the range type of live stock such as sheep and cattle. Larger units of machinery were found per acre on the heavier soil belts in each district than on the lighter ones. These are factors which distinguish the intensity of use of land within the various regions. The same type of definition can be made of the use of land by individual farmers. Some chose to use the intensive type of farming and others the more extensive system even on the same class of land.

It was obvious that the financial progress of operators varied greatly. Three sets of factors have been working to bring about these differences. The first has been that of variations in the physical productivity of the soil even within very limited districts. The second could be traced to management—the individual ability of the farmer to adjust himself and his business to the conditions prevailing. The third was that of market conditions for specific commodities such as wheat. All of these factors are of importance in a land utilization study. However, that of individual differences in the managerial ability of farmers is secondary since it is essentially a part of a farm management study. In this project, however, a large body of material was obtained relating to the farm management phases of agriculture. It seemed useful as a measuring rod of the merits of various types of farming and farmers, and essential to a clear understanding of the broader reasons for the present use of land, as well as pertinent to the question of future land use.

The clear definition of the part played by the physical factors of soil, topography and precipitation, and that of farm management practices such as tenure of operation, and relative use of live stock, machinery, labour and land, is in itself one object of the study. This definition is of major importance in any decision on the future land policy of the dry area. Territorial distinctions are obviously the easiest to discover and to use as a basis for program and policy. It is therefore pertinent that the physical definition be made apart from the farm management factors. It is then possible to zone out the various land classes and to apply policies of management and farm practices which will suit each major soil type, precipitation belt or other distinct physical feature which limits the production within an area.

The variation in financial progress of farmers from one soil belt or physical region to another has been due in some measure to the change in land values. Since all land at the time of settlement was of equal and almost nominal value, whether on the very best loams or the poorest sands, it was only natural that after a period of settlement those farmers on the more productive belts accumulated greater savings than those on the poor belts. Those lands which could be more intensively utilized provided a larger return to the land factor thus increasing their value, all of which accrued to the original holders. The increase in some cases amounted to as much as eight, ten or twelve thousand dollars per quarter. Comparing this with the value of land on some of the low precipitation, sandy soils where extensive agriculture prevails and where land can now be purchased for less than $160, per quarter section, the effect of changing land values on the financial progress of farmers is apparent.

From the point of view of farm management, the problem of financial progress is quite different. It is accepted generally that farm operators vary greatly in their ability to combine the factors of production for most economic returns. It is also generally accepted that this difference in ability will continue although the general level may be raised or lowered. In so far as the farm management factors are concerned, this study is primarily interested in

pointing out which operators seem to show the best results, and for what reasons. Further than this it is a matter for the administrator and the agricultural adviser to judge to what extent changes in farming practices will aid or hinder the individual farmer in his business.

Throughout this study fluctuations in price and cost relationships have been emphasized. Very low and very high prices have contributed substantially to the farmer's problem.

In order to discover the nature of agricultural land use and farming practices in the prairie area, two very limited districts, adjacent but with different soil and precipitation conditions, were selected for detailed study. These districts, surrounding the towns of Vulcan and of Lomond, were chosen as representative of at least a large part of the plains area. The Vulcan district is typical of the Dark Brown and Lomond of the Brown Soil (Figure 1.) These are the two major soil belts which constitute the prairie region of Alberta. Of necessity the area covered in the field survey was very small in relation to the total acreage of these two major soil belts. However, the material obtained is of such a nature that it makes a useful guide to the general conditions existing in the larger region. Further studies in other localities are now in progress.

THE REGION AND ITS PEOPLE

Geographic Setting

In 1863 Palliser in his report to the British Government on the resources of Western Canada described a triangular area (later known as Palliser's Triangle) having its base on the International Boundary lying between longitude 102 degrees W. (Turtle Mountain, Manitoba) and 114 degrees W. (Cardston, Alberta), and its apex on latitude 52 degrees N. (Saskatoon, Saskatchewan). He said that within this area successful farming would be impossible. The Lomond district[1] lies near the southwestern corner of Palliser's triangle. It includes that area which has for its boundaries the Little Bow River and Lake McGregor on the west, the Bow River on the east, Township 17 on the north, and the Old Man River on the south, excluding the irrigated area in the southeastern corner. It includes the district adjoining the villages of Lomond, Travers, Enchant and Retlaw. The Vulcan district,[1] immediately west of Lomond, comprises a territory beginning in the northwest corner of the town of Ensign and running southeast through the towns of Vulcan, Champion, Carmangay and Barons.

Climate.—The Lomond district is typical of the very dry prairie area which is subject to extended periods of drought and soil erosion by wind. Vulcan is typical of the specialized wheat belt at its zenith: a prairie district with usually sufficient moisture to give productive yields of wheat, and occasional dry years in which yields are very low. Here also soil drifting is prevalent. Evaporation is relatively high in each district. Both districts are primarily producers of wheat, although live stock are used by some farmers as a supplementary form of income especially during those years when wheat prices and yields became low.

[1] See Appendix A for list of townships included.

TABLE 1—AVERAGE ANNUAL PRECIPITATION OF THE LOMOND DISTRICT OF ALBERTA 1921-1931

Year	Vauxhall (Expanse Coulee)	Year	Vauxhall (Expanse Coulee)
1921	13·51	1928	6·77
1922	12·32	1929	9·83
1923	12·50	1930	12·51
1924	9·55	1931	7·54
1925	11·29		
1926	10·58	Average (1921-1931)	12·1
1927	23·89		

The precipitation figures for the Vauxhall station are indicative of the rain fall over a large part of the Lomond District. The great variation from year to year is clearly shown in Table 1. Little more evidence is necessary to indicate the periods of crop failures and crop successes, although it must be kept in mind that average precipitation for the year is only one general index of the effectiveness of rainfall; seasonal distribution is also very important. Generally speaking, the foregoing figures corresponded directly with the yields during the 11-year period. Only the years 1923 and 1927 were considered those of very good crops, although in spite of the low precipitation during the calendar year of 1928, a relatively good crop was harvested due to heavy rainfall in the preceding fall months and during June and July of the crop growing season. During these two months 78 per cent of the 1928 moisture fell.

Since the precipitation records for the Lomond district were only available for the 11 year period, it was difficult to estimate to what extent they represent the long time average. It was found that the rainfall in these 11 years corresponded very closely to those of the Medicine Hat station for which records were available for 48 years. The variations at this latter point were quite similar to those of the Vauxhall station although the average for the 48 year period was 12·80[1] or 0·69 inch higher than for the Vauxhall station (11 year average —12·10). The Medicine Hat average for the first twenty-four years of the period was only slightly higher than for the 24 year period ending in 1932, (13·20 inches as compared with 12·41 inches.) The average for Medicine Hat during the 12 year period 1921 to 1932 was 12·86 inches. This is some indication that rainfall did not change greatly during the decade up to 1932. If this is true the farmers of the Lomond district cannot expect much better moisture conditions than they experienced in the past decade. Any future land use policies must be based on an average expected rainfall between 12 and 13 inches, with probably a slightly larger number of years below the average than above it. (The Medicine Hat figures showed 28 years below the average and only 20 above in the 48 year period.)

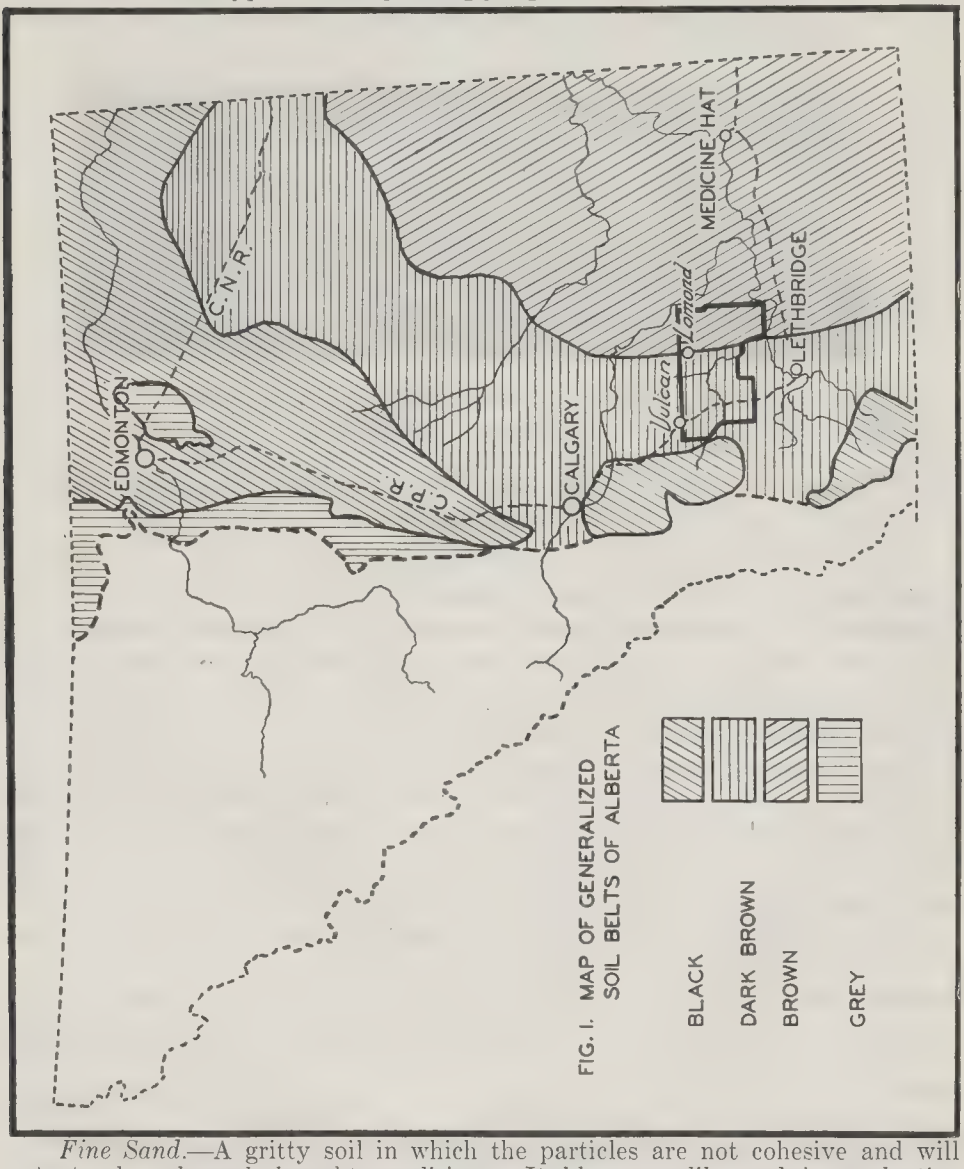
Rainfall figures for the Vulcan district were not available. No stations could be found in the area which provided representative figures. Observers in the district were satisfied that the Vulcan district was subject to a considerably greater average rainfall than was Lomond. Other evidence was based on soil texture and other data which will be discussed in due course.

It must be kept in mind that the Vulcan and Lomond districts are contiguous and therefore the two precipitation belts into which they fall are not mutually exclusive. From west to east the rainfall decreased very perceptibly. The lighter nature of the soil on the Lomond side of Lake McGregor, however, is sufficiently marked as to provide a substantial index of lower long-time precipitation on the eastern side of the lake than on the western side.

[1] Calculated from "The Canada Year Book, 1935", p. 53. Annual crop year precipitation 1884-1932.

Soil and Topography.—Lomond is placed by the general soil map of the Province into that belt termed "Brown Soil" and Vulcan is in that of the "Dark Brown Soil." (Figure 1.)

Within these two major soil regions, each district included five relatively distinct types of soil. The following is a short resume of the various soils to be found in the area.[1] Much the same soils are found in Lomond and Vulcan districts but each type is correspondingly lighter in the former.



Fine Sand.—A gritty soil in which the particles are not cohesive and will not stand prolonged drought conditions. It blows readily and is productive only with ample and continuous moisture supply. (Figure 2.) This is the least productive of all soils in the area. It is usually found close to the water-courses and therefore in regions with some broken topography, although most of the farms are found on the level stretches.

Fine Sandy Loam.—Found contiguous with the fine sand. Fine particles and better retention properties for moisture are typical of this soil. It is also

[1] See footnote page 7.

subject to periods of drifting due to its loose and open nature. Fertility is higher than that of the fine sand but generally less than the heavier soils. Undulating to rolling is the typical topography of these soil belts.

FIG. 2.—*Soil drifting on Carmangay Fine Sand, Alberta, 1935.*

Loam.—Physically an intermediate soil between the fine sand and the clay loam. It is generally more fertile than the fine sandy loam and suffers less from soil drifting. Like the fine sandy loam it is easily worked and found in the undulating to rolling topographical classes.

Silt Loam.—Generally speaking this is the most productive soil. It is finer in texture than the foregoing soils and less subject to drifting except in isolated spots. It is easily worked, absorbs water readily and retains it well. Undulating to rolling is the typical topography in the silt loam belts.

Clay Loam.—The finest texture soil in the area. The particles are relatively cohesive and somewhat heavier to work than the others. Fertility varies from approximately that of the loam to that of the silt loam and topography is much the same. Soil drifting is less prevalent than on the sandy soils.

Land Classes.—A rough classification of the land in the two districts was made chiefly with regard to the soil. Topographical features, stoniness and yield were also used. Six land classes were defined in each of the districts. (See Figure 3 for map showing land classes.) Table 2 lists these classes with the average yield per acre reported by farmers in 1934. The classes are listed in their approximate ranking according to long time productivity.

The variable productivity even on a long time basis is very evident from the figures in Table 2.

TABLE 2—LAND OR SOIL CLASSES AND AVERAGE YIELD OF WHEAT PER ACRE IN THE VULCAN AND LOMOND DISTRICTS OF ALBERTA, 1934

Vulcan		Lomond	
Land class	Yield of wheat	Land class	Yield of wheat
	bush.		bush.
Blackspring silt loam	16·4	Sundial silt clay loam	13·1
Vulcan fine sandy loam	16·4	Armada clay loam	10·7
Vulcan silt loam	13·6	Lomond-east clay loam	5·5
Vulcan loam	13·6	Lomond loam	4·6
Vulcan clay loam	8·9	Lomond fine sandy loam	2·4
Carmangay fine sand	5·8	Lomond fine sand	3·3
All farms	12·5	All farms	6·6

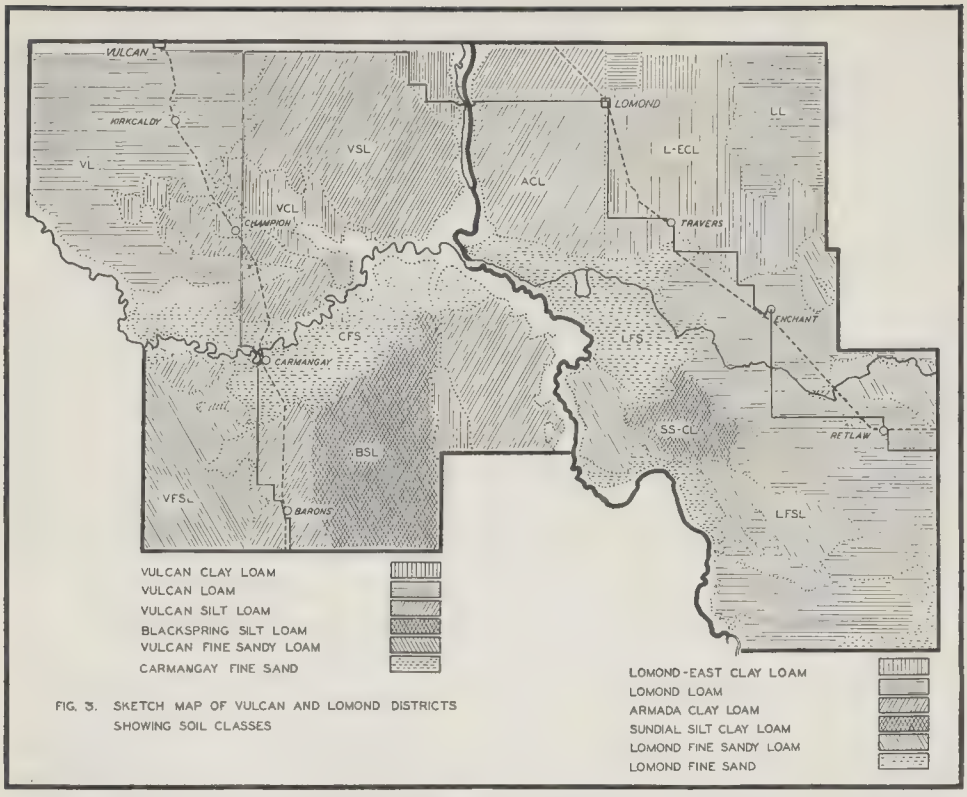


FIG. 3. SKETCH MAP OF VULCAN AND LOMOND DISTRICTS SHOWING SOIL CLASSES

Judgment of productivity by the field enumerators and soil surveyors seems to corroborate the yield data as an indicator of relative productivity. The variability of the yields needs little statistical evidence. However, Table 3 is given to show the average yields in certain Census years for the Municipal units covered in the survey. The Vulcan district had average yields almost double those of the Lomond district in each of the years 1921, 1926 and 1931. Table 1, Appendix C presents further yield data.

TABLE 3.—AVERAGE YIELD OF WHEAT PER ACRE IN THE VULCAN AND LOMOND DISTRICTS OF ALBERTA 1921, 1926 AND 1931

Census Year	Vulcan Bushels per acre	Lomond Bushels per acre	Alberta Bushels per acre
1921	12·6	6·9	20·5
1926	21·8	10·7	18·0
1931	18·0	8·7	18·6

Settlement and Population

The major part of the first settlement of the Vulcan area was accomplished between 1904 and 1908. Most of the better homestead land was taken up before 1906, although many pre-emptions, large sections of Canadian Pacific Railway, Hudson's Bay Company and School lands were sold in the raw state at later dates. Settlers trekked across country from towns on the railroad passing through Lethbridge, Claresholm, Nanton and other points. It is another example of the typical settlement of the west in which the railroad followed the settlers. A line was built from Blackie to Lethbridge in 1911. Previous to this all grain was hauled across country to the Calgary-Macleod line and to Lethbridge.

The settlement of the Lomond district was two or three years later than that of Vulcan, and so also was the penetration of the railroad which now runs through the area.

In 1901 only 18 persons were recorded as living in the Vulcan district,[1] and in 1906 the number had increased to 2,163 with a further increase to 3,420 by the time the railroad had reached the district in 1911. (Table 4.) By 1916 the population numbered 4,564. Further increases were noticeable in the Census of 1921 when the district contained the maximum population of 5,570 persons. The Census of 1926 and 1931 have shown practically no change, 5,445 persons in 1926 and 5,529 in 1931.

The population of Lomond presents a very different picture, especially during the past three Census periods (1921, 1926 and 1931.) The district contained only four persons in 1901, 48 in 1906 and 3,072 in 1911 after the great wave of settlement. In 1916 the numbers had grown to 3,577, and in 1921 to 4,213, but a very material abandonment took place during the post-war depression after a series of very dry years, leaving the area with only 2,490 persons in 1926. The 1931 Census showed the population at that time to have returned to approximately its 1911 numbers (3,020.) Since then a further abandonment has taken place.

The history of Vulcan has been one of continued consolidation and growth toward maturity in contrast to the fluctuating development of Lomond. Table 4 summarizes the numbers of population as taken from the Census of Canada.

TABLE 4.—FARM AND VILLAGE POPULATION OF THE VULCAN-LOMOND AREA OF ALBERTA[1] 1901-1931

Year	Vulcan			Lomond		
	On farms	In villages	Total	On farms	In villages	Total
1901	.....	.....	18	.....	.....	4
1906	.....	.....	2,163	.....	.....	48
1911	3,059	361	3,420	.....	.....	3,072
1916	3,398	1,166	4,564	3,470	107	3,577
1921	4,038	1,532	5,570	3,773	440	4,213
1926	3,837	1,608	5,445	2,182	308	2,490
1931	3,853	1,676	5,529	2,668	352	3,020

[1] Townships listed in Appendix A.

Town and Rural Population.—An interesting index of the growing standard of living and development toward a mature district is shown by the ratio of townsfolk to rural population. In Vulcan the towns were almost non-existent until 1910, but since that time the ratio of townsfolk to rural people showed a continual upward trend. In 1911 the number of townsfolk per 100 rural persons was 11·8. This has gradually increased since that time with a ratio of 37·9 in 1921 and 43·4 in 1931. In the permanent fringe (Lomond) the highest point recorded by the Census was 14·1 in 1926 and in the following Census year, 1931, it showed a slight decline to 13·1 townsfolk to every 100 rural persons. This is merely another index of the unstable nature of the dry eastern district in which very little growth toward consolidation of the community and maturity has yet occurred. Insufficient and sporadic farm returns have not encouraged the growth and development of towns. At the time data were secured from farmers no banks remained in the Lomond district, the closest being at Vulcan, Champion and Barons in the western district. The last bank was moved in 1934 from the town of Lomond. This was only one of many examples of town services that had grown, flourished and decayed in the Lomond community due to the inability of the rural population to support

[1] Census of Canada for townships listed in Appendix A.

them. Lack of services in the Lomond district enlarged the sphere of influence of the towns in the Vulcan area.

National Origin and Birthplace of Operators.—The pattern of racial backgrounds of the farm operators in this study is typical of the prairie area. The large majority were born in English-speaking countries, but a representative group of Continental European stock was found (Table 5.) Thirty per cent of the Vulcan farmers and 24 per cent of those in Lomond were born in Canada. Great Britain was the birthplace of 8 per cent of the Vulcan operators as compared with 14 per cent in the Lomond district. A larger proportion were born in the United States than in any other single country: 44 per cent of the Vulcan farmers and 33 per cent of those in the Lomond district. Twenty-nine per cent of the Lomond operators and 18 per cent of the Vulcan operators were born in Continental Europe. The distribution of population on the basis of national origin showed essentially the same picture.

Of chief interest is the fact that the Vulcan and Lomond districts were quite similar in the racial pattern. A slightly higher proportion of British in Vulcan and of Scandinavian in Lomond were the only noticeable differences. The various soil belts were also quite similar in racial distribution to that of the area as a whole. National origin and birthplace were not a distinguishing factor in the comparison of farm practices and land use between the two dis-districts and between individual soil belts.

TABLE 5.—BIRTHPLACE AND NATIONAL ORIGIN OF FARM OPERATORS IN THE VULCAN-LOMOND AREA OF ALBERTA

Birthplace	Vulcan Operators		Lomond Operators		National Origin	Vulcan Operators		Lomond Operators	
	No.	%	No.	%		No.	%	No.	%
Canada	69	30	64	24	British	136	59	126	49
Great Britain	19	8	37	14	American	4	2	3	1
United States	102	44	86	33	Scandinavian	33	14	71	27
N. W. Europe	26	11	54	21	N. W. Europe	48	21	37	14
S. E. Europe	16	7	20	8	S. E. Europe	10	4	24	9
					Negro	1	*	.....	.....
Total	232	100	261	100	Total	232	100	261	100

* Less than 0·5%.

Occupational History of Operators.—The occupational history of the Vulcan and Lomond farmers is quite typical of most areas in which a large proportion of the original settlers are still operating farms in the territory. (Table 6.) Many of the operators had at some time been engaged in pursuits other than farming, especially in the more fringelike Lomond district, where 57 per cent of the operators had been engaged in such occupations as railroad

TABLE 6.—OCCUPATIONAL HISTORY OF FARM OPERATORS VULCAN AND DISTRICTS OF ALBERTA

Occupation	Vulcan			Lomond		
	Farmers		Average Years	Farmers		Average Years
	No.	%	No.	No.	%	No.
Age commencing full time work	232	100	15·3	261	100	15·2
Work on parents' farm	147	63	5·0	165	63	4·2
Work on other farms	77	33	2·8	93	36	2·7
Years at other occupations	117	50	5·3	150	57	5·6
Tenant on other farms	53	23	1·4	46	18	1·0
Tenant on this farm	58	25	1·2	60	23	1·2
Owner of other farms	86	37	4·0	95	36	4·8
Owner of this farm	185	80	15·0	217	83	15·1
Age of operator	232	100	50·0	261	100	49·8

construction, lumbering, mining, garage work, and in the army. In Vulcan the parallel figure was 50 per cent. The average number of years spent by all operators in pursuits other than farming was 5·3 in Vulcan and 5·6 in Lomond. However, the average operator was essentially a farmer. The Vulcan operators averaged 29·4 years of full time work on farms, and the Lomond operators 29·0 years. The majority of the operators had adequate experience in the farming practices which were followed in the dry prairie region. Approximately 20 years of the average farmer's time was spent in the area visited.

Residential History of Operators.—Many operators had farming experience in the United States, Great Britain and the Continent. The average farmer in each district spent between 18 and 19 years in other countries, although most of this was previous to the age at which he began full-time work. Very few had lived in Prairie Provinces other than Alberta, although the average farmer spent from 5 to 7 years in Provinces other than those of the Prairie, chiefly before the age commencing full-time work. These figures add to the evidence which showed that the farmers in these areas were essentially familiar with the conditions which now prevail in the districts of Vulcan and Lomond.

The major physical features of the region have been outlined, and the districts placed in the larger area of which they are a sample. The characteristics of the population have also been presented. This leads directly to a statement of the acquisition of land and the establishment of the farm unit.

ACQUISITION OF LAND AND ABANDONMENT

Land Acquisition

When settlement began in the southern prairies, all land was of approximately the same value. Since the large part of it was open to homesteading[1] and pre-emption[2] at a nominal figure, without differentiation between soil types or other physical features, those farmers who happened to locate on the better lands reaped the profits from later increases in value. Many farmers found themselves operating on very unproductive soils, suited only to an extensive system of farming and were often great distances from towns and transportation facilities. In some cases the land reverted very rapidly to the crown through abandonment, while in other cases, the values increased but little and the settlers began with very different chances of financial progress.

Thus the progress of the settlers even within very limited localities and between adjacent districts was much influenced by the comparatively rapid changes in land values which occurred owing to the original method of land purchase. The effect of these increases or decreases in land equity was of paramount importance in studying land tenure problems, while another problem, very closely linked, was that of the recurrent fluctuations in land values since settlement.

Data will be presented which show the average prices paid by operators for their land during different time periods.

The wide range in prices paid, often for the same parcel of land at different periods, is very striking. Naturally, then, since buying of land involved the investment of the operator's savings and since it usually entailed the encumbrance of agreements of sale or mortgages, the changing price and yield of wheat, and business cycle fluctuations, the risk of farming was very materially increased. The present debt situation is largely a result of land purchase, usually at times when prices were high. During times of depression or drought, the assets of the farmers decrease in value and their liabilities increase. It is not only the dry regions which are faced with this problem. It

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[1] Homestead grants of 160 acres made to all settlers for the payment of $10 fee and title obtainable in three years after completion of certain duties and improvements.

[2] Pre-emption grants of 160 acres to all settlers after 1908 for the sum of $480 plus specified duties and improvements to be completed within a period of 3 years.

is more or less universal in the farming world and often the business cycle fluctuations hit hardest in the districts of high values due to the larger proportion of credit which is usually extended.

Settlement and Method of Acquisition.—Many farmers now living in the Vulcan-Lomond district got their start by obtaining free land. Land for homesteading was thrown open at an earlier date in the Vulcan district—about 1904, and in the Lomond district about 1908. Of all the homesteading owners that were interviewed, 18 per cent homesteaded before 1905 and 96 per cent before 1909 in the Vulcan district. (Table 7.) Only 65 per cent of the owners homesteaded during or before 1909 in the Lomond district. The years 1909-10 were those in which the largest amount of land was homesteaded.

A number of homesteaders pre-empted another quarter at the time they filed on their homestead. The earliest pre-emptions reported for both districts were between 1908 and 1909. Others acquired land through purchase, one operator reporting a purchase as early as 1900 in the Vulcan district, while the earliest purchase reported for Lomond district was in 1905.

TABLE 7.—METHOD OF LAND ACQUISITION BY FIVE-YEAR PERIODS, VULCAN-LOMOND AREA OF ALBERTA, 1900-1935

Year Acquired	Vulcan					Lomond				
	Homestead	Pre-emption	Purchase	Legacies	Total	Homestead	Pre-emption	Purchase	Legacies	Total
	No.	No.	No.	No.		No.	No.	No.	No.	
1900-1904	12	.....	1	.....	13	.....	.....	.....	.....	.....
1905-1909	53	6	24	1	84	87	67	3	2	159
1910-1914	2	1	57	.....	60	28	13	25	1	67
1915-1919	.....	.....	114	2	116	2	1	66	4	73
1920-1924	.....	.....	16	9	25	2	1	18	2	23
1925-1929	.....	.....	97	6	103	10	.....	192	4	206
1930-1935	1	.....	32	7	40	4	.....	60	6	70
All acquisitions	68	7	341	25	441	133	82	364	19	598

Amount of Land Acquired.—A summary has been prepared to show the amount of land obtained by homesteading, pre-emption, legacies and purchases. This information is assembled in Table 8.

The figures in Table 8 indicate that of the total land purchased, 52 per cent was purchased before 1920 in the Vulcan district and only 20 per cent in

TABLE 8.—ACREAGE OF LANDS ACQUIRED BY THE OWNER OPERATORS OF FARMS BY HOMESTEADS, PRE-EMPTIONS, LEGACIES AND PURCHASE IN VULCAN AND LOMOND DISTRICTS OF ALBERTA

Method of acquisition	Vulcan		Lomond	
	Acres	Per cent total land obtained	Acres	Per cent total land obtained
Homestead	10,960	11	21,688	18
Pre-emption	1,120	1	12,800	10
Legacies	7,739	7	4,000	3
Total	19,819	19	38,488	31
Purchases before 1920	44,576	42	17,120	14
Purchases 1920-1935	40,936	39	67,761	55
Total	85,512	81	84,831	69
Total land obtained	105,331	100	123,369	100

the Lomond district during the same period. After 1920 Lomond operators made more purchases than did those of Vulcan but a higher percentage owned land was obtained by purchase over the whole period in the Vulcan than in the Lomond district (81 per cent as compared with 69 per cent). The abandonment of 1921-24 and subsequent resettlement was responsible for the larger number of Lomond purchases after 1920.

Establishing the Land Unit.—The average original holding of the Vulcan farmers was 271 acres, while that of Lomond was 214 acres. The range of addition per operator for those that made any additions varied from 80 to 640 acres for Vulcan and 160 to 224 acres in the Lomond district.

Not all operators, however, made additions beyond their original holdings. Of the 186 operators involved in the Vulcan district (See Table 9), 38 per cent made no additions. In the Lomond district, of the 216 operators involved, 23 per cent made no additions while 51 per cent made no more than one. Lomond operators discovered the need for larger farms and consequently made a larger number of additional acquisitions.

TABLE 9.—NUMBER AND PERCENTAGE OF THOSE MAKING ADDITIONS TO ORIGINAL HOLDINGS IN THE VULCAN AND LOMOND DISTRICTS OF ALBERTA 1900-1935

Number of acquisition	Vulcan District		Lomond District	
	Number of operators	Operators making acquisition	Number of operators	Operators making acquisition
	No.	Per cent	No.	Per cent
Original holding	186	100·0	216	100·0
First addition	115	61·8	167	77·3
Second addition	62	33·3	106	49·0
Third addition	34	18·3	56	25·9
Fourth addition	21	11·3	31	14·4
Fifth addition	12	6·5	11	5·1
Sixth addition	6	3·2	6	2·8
Seventh to twelfth	1	0·5	3	1·4

Price Paid for Land.—The price paid for land depends upon a number of factors such as soil type, prices of farm products, time of purchase, access

TABLE 10.—LAND PURCHASED IN VULCAN AND LOMOND DISTRICTS OF ALBERTA BY FIVE-YEAR PERIODS 1900-1935

Date of purchase	Vulcan District				Lomond District			
	Number of purchases	Acres bought	Average Price per acre	Average cash payment	Number of purchases	Acres bought	Average Price per acre	Average cash payment
			$ cts.	Per cent			$ cts.	Per cent
1900–1904	1	160	5 00	20	.....	.....	.....	.....
1905–1909	21	5,180	21 93	39	3	480	14 75	70
1910–1914	55	12,885	21 67	37	23	4,160	13 43	88
1915–1919	112	24,911	27 68	47	65	12,000	17 47	77
1900–1919	189	43,136	25 11	43	91	16,640	16 38	80
1920–1924	15	4,640	29 09[1]	36	18	3,600	10 85[1]	54
1925–1929	95	26,520	24 13	39	191	47,431	7 54	51
1930–1935	32	8,816	24 52[2]	23	60	16,410	9 20[2]	35
1920–1935	142	39,976	24 78	35	269	67,441	8 12	48
Total (1905–1935)	331	83,112	24 96	40	360	84,081	9 76	56

[1] Purchases largely contracted in 1920 before the great fall in wheat prices.
[2] Includes numerous purchases made on bushelage basis without stated interest.

to good roads, distance from market and community services. Again, the expansion of the size of farm holding has increased the demand at times for land and temporarily raised its price. Last, but not least is "land speculation" which may be responsible for temporary increases in the price of land.

Table 10 summarizes the price paid per acre by five-year periods. A total of 83,112 acres of land were purchased in the Vulcan district at a cost of $2,074,120, of which 40 per cent was paid down as a cash payment. In the Lomond district 84,081 acres of land were purchased at a cost of $820,420, of which 56 per cent was a cash payment. Land was sold at a much higher figure per acre in the Vulcan district, the average purchase price being $24.96 as compared with $9.76 in the Lomond district.

In the Vulcan district the highest prices were paid during 1915-24 periods. The high prices for farm products, because of war-time demand resulted in a rise in prices of land during this period. Although there was a drop in the prices of farm products in 1920, land values continued to rise in the Vulcan district, and an average of $29.09 per acre was reached for the 1920-24 period, due to the transactions in 1920.

The prices paid for land in the Lomond district follow farm prices quite closely. The highest average price per acre purchased was for the 1915-19 period, when an average of $17.47 per acre was paid. There was a decided decline in the next five-year interval, and land sold during this period averaged only $10.85 per acre.

As the relative productivity of the land became known, there was a tremendous decline in the average price paid per acre from the 1905-19 period, to that of 1920-35 in the Lomond district. During the former period land was purchased at an average price of $16.38, while during the latter it was purchased for $8.12. Only a slight decline was noticed in the Vulcan district due to continued productivity on a comparable basis with the previous period. During the 1900-19 period the average price paid per acre was $25.11, and during the 1920-35 period the average purchase price was $24.78. It is quite evident that the more stable production of the Vulcan district was reflected in the land values.

Table 11 presents a frequency distribution of prices paid per acre in both the Vulcan and Lomond districts. Less than 4 per cent of land was purchased for $5 an acre or less in the Vulcan district, while 28 per cent of the total purchase was made at $5 an acre or less in the Lomond district.

TABLE 11.—PRICES PAID PER ACRE OF LAND IN THE VULCAN AND LOMOND DISTRICTS OF ALBERTA 1900–1935

Range of prices paid	Vulcan district			Lomond district		
	Number	Per cent	Cumulative per cent	Number	Per cent	Cumulative per cent
$ cts.						
0 01– 5 00	12	4	4	102	28	28
5 01–10 00	29	9	13	124	35	63
10 01–15 00	47	14	27	63	18	81
15 01–20 00	67	20	47	39	10	91
20 01–25 00	71	21	68	25	7	98
25 01–30 00	33	10	78	1	*	*
30 01–35 00	18	5	83	6	2	100
35 01–40 00	15	5	88	.....	.....	.....
40 01–45 00	10	3	91	.....	.....	.....
45 01–50 00	17	5	96	.....	.....	.....
50 01–55 00	4	1	97	.....	.....	.....
55 01–60 00	3	1	98	.....	.....	.....
60 01–65 00	2	1	99	.....	.....	.....
65 01–70 00	2	1	100	.....	.....	.....
70 01–75 00	1	*	100	.....	.....	.....
	331	100	100	360	100	100

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Of the Vulcan sales 53 per cent were made at over $20 an acre, while only 9 per cent of the Lomond transactions took place at over $20 an acre and sales were reported over $35 an acre. The range of prices paid for the Vulcan district was from $1.56[1] per acre purchased in the 1930-35 period up to $75[2] per acre purchased in the 1920-24 period. The range for the Lomond district was from $0.94 per acre for the 1925-29 period to $32 per acre for the 1930-35 period. This latter purchase was made on a bushelage basis, and therefore at a relatively high figure due to greater risk for the vendor.

TABLE 12.—AVERAGE PRICE PAID PER ACRE OF LAND PURCHASED BY SOIL CLASSES IN THE VULCAN DISTRICT OF ALBERTA 1900–1935

Date of purchase	Black-spring silt loam	Vulcan fine sandyloam	Vulcan silt loam	Vulcan loam	Vulcan clay loam	Carman-gay fine sand	All Vulcan
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
1900–1904	.....	.....	5 00	.....	.....	.....	5 00
1905–1909	21 65	21 09	25 00	17 55	25 00	31 54	21 93
1910–1914	21 03	19 67	20 64	23 56	23 97	21 02	21 67
1915–1919	28 05	24 97	26 72	29 91	29 11	23 03	27 68
1900–1919	24 57	23 31	24 95	25 64	26 96	23 85	25 11
1920–1924	28 75	15 62	28 57	53 18	.....	8 54	29 09
1925–1929	27 52	18 25	26 51	33 24	18 64	11 42	24 13
1930–1935	19 25	25 98	17 84	39 90	13 58	30 00	24 52
1920–1935	26 15	19 90	24 62	39 37	17 13	12 02	24 78
Total (1900–1935)	25 24	21 37	24 80	32 44	22 39	17 11	24 96

TABLE 13.—AVERAGE PRICE PAID PER ACRE OF LAND PURCHASED BY SOIL CLASSES IN THE LOMOND DISTRICT OF ALBERTA 1900–1935

Date of purchase	Sundial silt clay loam	Armada clay loam	Lomond-east clay loam	Lomond loam	Lomond fine sandy loam	Lomond fine sand	All Lomond
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
1900–1904	.....	.....	.....	.....	.....	.....	.....
1905–1909	.....	.....	.....	14 75	.....	.....	14 75
1910–1914	10 00	15 62	7 34	13 03	9 58	10 00	13 43
1915–1919	19 69	20 18	16 18	16 95	21 51	15 92	17 47
1900–1919	18 30	18 52	15 81	15 46	17 53	14 61	16 38
1920–1924	.....	5 09	10 71	15 51	.....	.....	10 85
1925–1929	9 52	9 30	7 79	7 07	7 40	4 72	7 54
1930–1935	9 72	9 08	10 10	10 42	10 34	4 48	9 20
1920–1935[1]	9 64	9 09	8 51	8 54	8 50	4 69	8 12
Total (1900–1935)	12 28	10 24	9 95	10 23	9 93	7 21	9 76

[1] Largely on a bushelage basis discounted here at an average rate of interest and average period of repayment.

Tables 12 and 13 summarize the price paid per acre for land on various soil types for both districts. (Figure 4.) At an early date unusually high prices were paid for land on the Carmangay fine sand. This is a fertile sand and required a minimum of cultivation in the first few years. The 1900-19 average price per acre was $23.85, which was slightly higher than the price paid for the land on the Vulcan Fine Sandy Loam. However, when the later pro-

[1] Purchase of very rough land.
[2] Purchase of land adjacent to town of Vulcan.

ductivity of the soil became better known and continued cropping reduced yields, the price per acre dropped to $12.02 for the 1920-35 period. Only one sale as high as $30 per acre was reported for the 1930-35 period and this was on a bushelage basis. For the long-time average of 1900-35, the land sold at an average figure of $17.11 per acre on the same soil type, which was considerably lower than the price paid on the other soil types.

Only the purchases on the Vulcan loam and Blackspring silt loam showed an increase in purchase price for the 1920-35 period when compared to 1900-19 average, the most decided increase being on the Vulcan loam due in some measure to its proximity to the town of Vulcan.

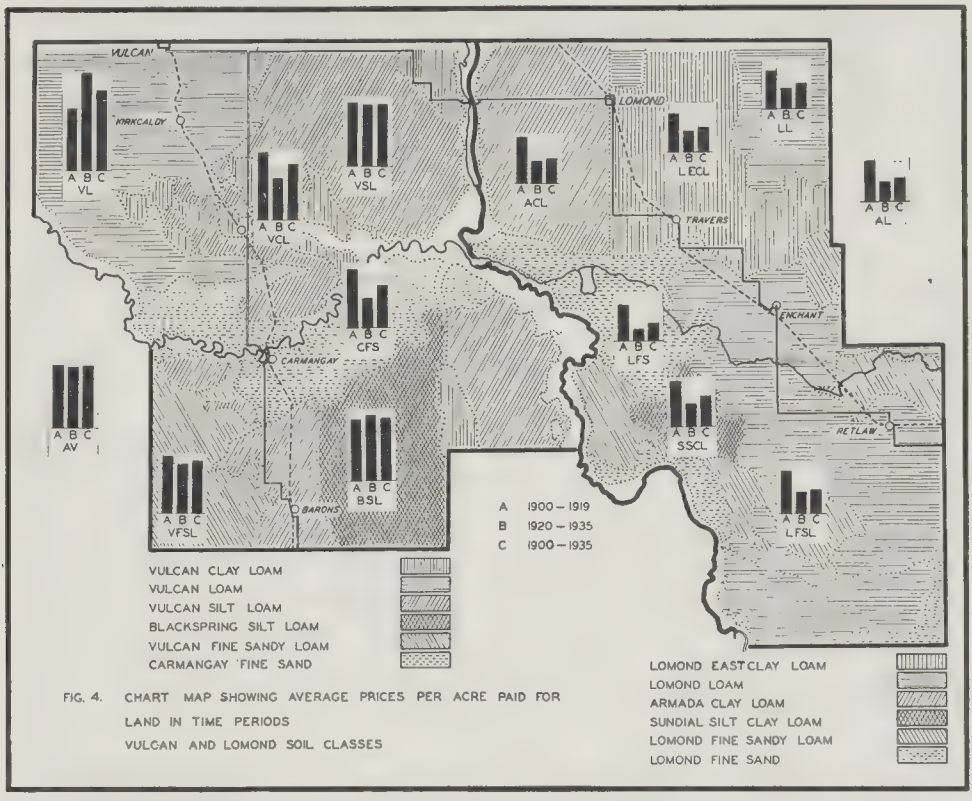

FIG. 4. CHART MAP SHOWING AVERAGE PRICES PER ACRE PAID FOR LAND IN TIME PERIODS VULCAN AND LOMOND SOIL CLASSES

No such increases were noted for the Lomond district as figures in Table 13 indicate. All purchases were made at a much lower average price per acre for the 1920-35 period when compared to the 1905-19 average. Adjustment to lower farm prices and low yields is gradually being made through decreased land values.

Land Credit.—The purchase of land has been an important factor in extension of credit to farmers of the prairies. Many farmers with only a minimum of net worth assumed heavy obligations through the purchase of land on agreements of sale. The amounts of indebtedness for which the land was security will appear in the section on farm indebtedness. The proportionate amount of cash and credit involved in the purchase of land by the operators is presented here. Table 14 summarizes the percentage of cash payments for both districts. Two-thirds of all transactions carried cash payments of 50 per cent or less in the Vulcan districts compared with a little over two-fifths of the Lomond transactions. The absolute amount of cash payments was much less in the latter district. Of the 282 transactions in the Vulcan district, 67 or 24

TABLE 14.—DISTRIBUTION OF PERCENTAGE CASH PAYMENTS ON LAND PURCHASES IN THE VULCAN AND LOMOND DISTRICTS OF ALBERTA, 1900-1935

Percentage of cash range	Vulcan		Lomond	
	Number of purchases	Cumulative percentage	Number of purchases	Cumulative percentage
$	No.	Per cent	No.	Per cent
0–10	39	14	47	14
11–20	69	38	36	25
21–30	36	51	42	37
31–40	29	61	15	41
41–50	15	67	10	44
51–60	15	72	21	50
61–70	6	74	9	53
71–80	5	76	3	54
81–90	1	76	1	54
91–100	67	100	155	100
Total	282	.....	339	.....

per cent were all cash deals, and only 16 or 6 per cent made no cash payments at the time of purchase. In the Lomond district, of the 339 transactions, 154 or 45 per cent were all cash deals, and 27 or 8 per cent made no cash payment at the time the purchase was made. The larger proportion of cash deals in the Lomond district was due to the small amounts of money required to complete cash deals.

Recent Developments in Buying Land.—Within the last few years, and particularly in the Lomond district, there has been a trend toward buying land on a bushel basis. Apparently the purchasers of land have resorted to this type of contract in order to allow for the fluctuation of wheat prices from year to year. The details of the contract vary, but an example may be cited here to illustrate the type of agreement that is made. A purchase of 320 acres of land was made for 8,000 bushels of wheat—payments to be one-third crop until paid in full, the original bushelage contract including whatever interest the seller had calculated. The price purchase ranged from 5 bushels per acre to 31 bushels for the Lomond district and from 18 to 47 bushels in Vulcan.[1]

This change in the type of sale contract is indicative of the trend toward adjusting land values to the productivity of the soil, but more especially to minimize the risk involved in the values of wheat from year to year and period to period. It is merely a shifting of more of the risk to the vendor of land.

Farm Abandonment

The chief agricultural problems of the abandoned farm area of Southern Alberta are those which are characteristic of land abandonment throughout Western Canada's dry lands. When these lands were opened up for settlement occupation was very rapid. Little was known of the nature of the soil, climate, insect pests, and other factors which would vitally affect the agricultural development of the district. The first settlers had to develop dry farming methods by trial and error. Early failures on the poorer farms therefore were inevitable. Unfortunately successive operators took up the abandoned farms largely through lack of knowledge of the problems which faced them. The costs involved in such settlement have been prodigious and cannot be measured in dollars and cents only, because much human privation followed failure on these farms. (Figure 5).

[1] This has been calculated for the tables on present value basis of wheat at 83c. per bushel amortized for 20 years at 6 per cent.

FIG. 5.—Mute evidence of hope, hard work and subsequent desolation on Lomond east clay loam. Alberta, 1935.

It was impossible to get details of all the abandoned land in the area. However, the 126 abandoned farms[1] concerning which information was obtained offer a cross-section of abandonment, and enable one to form a reasonably accurate picture of the nature of the abandonment which has taken place in the area. The records are all from the Lomond district in which most of the

TABLE 15.—DISTRIBUTION OF ABANDONED FARMS IN THE LOMOND DISTRICT OF ALBERTA ACCORDING TO YEARS IN WHICH LAND WAS FIRST FARMED, 1906–1935

—	Number of farms	Percentage	Cumulative percentage
1906–1910	62	69	69
1911–1915	9	10	79
1916–1920	7	8	87
1921–1925	6	7	94
1926–1930	1	1	95
1931–1935	5	5	100
Total	90	100	100

abandonment occurred. No information was obtained in the Vulcan district although some abandonment was found there, especially on the Carmangay fine sand. A complete history of 90 farms was secured, and of these 60 per cent were first farmed before 1910 and 79 per cent were first farmed before 1915; 87 per cent of the farms were first farmed twenty years or more ago. (Table 15.) The average number of years since the date of settlement was 23·08. Only 6 per cent of the farms were brought under cultivation within the last ten years. The more recently acquired virgin land was obtained from the various land companies. However, in spite of evidence of unsuccessful settlement, some individuals continued to file on the land throughout the whole period since 1906. Thus the wave of settlement was well under way before the opening of the Great War and the period of high prices for agicultural products.

The years 1903 to 1910 were considerably drier than average, and it may be wondered why, in spite of this, settlement was so active. However, most of the homesteads were taken up after 1908, and hence little land was seeded

[1] The data are not complete for all details. See Appendix B for definition of abandoned farms.

to crops until 1911. Low yields, therefore, were not in evidence to discourage settlement. In 1911, ample moisture fell, and much better than average rainfall continued until 1917.

TABLE 16.—METHOD OF ACQUISITION BY FIRST OPERATOR, ABANDONED FARMS, LOMOND DISTRICT OF ALBERTA, 1935

Acquisition	Number of farms	Percentage
Homestead and pre-emption	102	88
Purchased from—		
Canadian Pacific Railway	3	3
Hudson's Bay Company	6	5
Government	4	3
Canada Land Company	1	1
Total	116	100

Method of Acquisition by First Operator.—The land open to homestead and pre-emption was almost entirely filed upon by 1911 except for a few cancellations. The remaining farms were obtained by purchase from the Canadian Pacific Railway Company, the Hudson's Bay Company, the Dominion Government (School Lands), and the Canada Land and Irrigation Company. Table 16 shows that 88 per cent of the abandoned farms were homesteads and pre-emptions.

Years Farmed.—Twenty-four per cent of the holdings were farmed less than five years (Table 17), and 40 per cent less than ten years. Only one of the farms had been in operation continuously up to 1934.

TABLE 17.—NUMBER OF YEARS FARMS HAVE BEEN OPERATED, ABANDONED FARMS, LOMOND DISTRICT OF ALBERTA

—	Number of farms	Percentage	Cumulative percentage
1901–1905	16	24	24
1906–1910	11	16	40
1911–1915	15	23	63
1916–1920	10	14	77
1921–1925	14	21	98
1926–1930	1	1	99
1931–1935	1	1	100
Total	68	100	100

Twenty-eight per cent of the farms had only one operator (Table 18). Some of these men were speculative homesteaders who took poor land by mistake, failed in their efforts at farming and moved off. A few of them did not remain long enough to complete the Government's requirements before title to the property was granted. Thirty-two per cent of the farms had three or more operators. These were probably operated in a haphazard manner. They were cultivated for a few years on the get-rich-quick plan, abandoned, rented or sold when conditions appeared to be more favourable, and the cycle was repeated several times.

Of those who operated the farms last, 59 per cent operated them five years or less. More than one-quarter of them were operated for one year only. However, the fact that 11 per cent were operated sixteen years or more is highly significant. There are factors which do make it possible for certain farmers

to carry on for long periods of time under the most adverse conditions. Inertia, direct relief policies, hope for improvement in weather conditions and occasional high yields are among the most important.

TABLE 18.—NUMBER OF OPERATORS ON EACH ABANDONED FARM, LOMOND DISTRICT OF ALBERTA

Number of operators	Number of farms	Percentage	Cumulative percentage
1	26	28	28
2	38	40	68
3	25	26	94
4	3	3	97
5	2	2	99
6	1	1	100
Total	95	100	100

Homesteaders formed 27 per cent of the last operators; 34 per cent were renters; 38 per cent were purchasers. Homesteaders were those who remained on the farm longest; purchasers next longest, and renters remained for the shortest period.

Most of the farms were fairly well supplied with school facilities. Even to-day, when several schools have been closed and several others re-located in Lomond, Retlaw, and Enchant under a consolidation of schools, 71 per cent of the farms are only three miles or less from a school and 48 per cent are two miles or less from school. Not all of the schools have been in continuous operation. One farm was more than seven miles from a school. Remoteness from a school was one reason for abandonment, and the relatively great distance between neighbours was no doubt a factor in the movement.

It is frequently maintained that distance from a shipping point is a limiting factor. Economic production for the farmer includes hauling. Farms which are devoted chiefly to wheat growing can be successful and still be more distant from a shipping point than in the case of some other types of agriculture. However, three-quarters of the abandoned farms (Table 19) lay within a ten-mile limit. The roads were reasonably good throughout the year. Most of these farms were therefore not handicapped by great distance from shipping points.

TABLE 19.—MILES FROM SHIPPING POINT, ABANDONED FARMS, LOMOND DISTRICT OF ALBERTA

Miles	Number of farms	Percentage	Cumulative percentage
0- 2	9	7	7
3- 4	28	22	29
5- 6	21	17	46
7- 8	19	15	61
9-10	16	13	74
11-12	12	10	84
13-14	8	6	90
Over 14	13	10	100
Total	126	100	100

Soils.—A greater proportion of abandonment occurred on the sands (fine sand and fine sandy loam) than on the loams. Thirty per cent of the farms abandoned were on the sands, though they comprise only about 20 per cent of

the total area. No abandonment occurred on the Sundial silt clay loam. Forty-three per cent of the farms were on clay loams. These clay loams are quite inferior to those farther west of the area abandoned. The nitrogen content is low, many stones are present, and the subsoil forms an impervious hardpan in the normally dry years. Ten per cent of the farms had a sufficient number of stones to cause serious difficulty in cultivation.

FIG. 6.—Farm buildings abandoned in 1933 on the Lomond loam. Alberta, 1935.

Present Ownership.—Forty per cent of the abandoned farms now belong to the Provincial Government. Individuals owned 27 per cent, municipalities 3 per cent, and the remaining 30 per cent belonged to private companies. The number of farms reverting to the Provincial Government and the municipalities for taxes rose steadily with the greatest numbers of reversions occurring within the last five years. The large number of farms reverting to the Provincial Government rather than to municipalities is because most of the 126 farms of this study lay in improvement districts under the direct control of the Province of Alberta. Most of the land owned by the private companies was once homesteaded and has been taken over for mortgage indebtedness. The decrease from 88 per cent private ownership at the time of settlement to only 27 per cent now is significant of the amount of insolvency prevailing among the ex-operators.

Present Condition of Farms.—Forty-five dwellings were left on these farms, only 21 of which were habitable (Figure 6). Those which had disappeared, mostly shacks, were largely in use on other farms in Lomond, Enchant and Retlaw as granaries, sheds and dwellings. Only three windbreaks were present, indicating that almost no attempt had ever been made to make a permanent home on these farms. Fifty-eight had fences, most of which were badly dilapidated. Indications were present that there had been other fences but that they had been moved elsewhere. Only 27 had a water supply, which in general was poor, both as to quality and quantity, and was without doubt an important cause of abandonment.

Reasons for Abandonment.—A great variety of reasons were given for abandonment, with drought and soil drifting accounting for 59 per cent. Poor soil and stony land accounted for 8 per cent of the reasons, and grasshoppers and cutworms 2 per cent. Over two-thirds of the abandonments, therefore, were due to the purely physical nature of the farms and its environment. Of the remaining third, 8 per cent were personal in nature: family difficulties, poor

health, and death. Four per cent were due to foreclosures and 4 per cent to inability to pay for the farm, and quit claims were given. It must be recognized that abandonment was due to a complex set of conditions in each case.

In the decade 1910 to 1920, 16 per cent of the farms were abandoned in spite of the high prices for farm products then prevailing and the fact that the farmers were tilling virgin soil. A number of these were proved up and left before the war. Some of the land filed upon was found to be too poor to war-

FIG. 7.—One stage in the restoration of land to prairie grass. Patches of sage indicate land which was once broken or overgrazed. Lomond east clay loam. Alberta, 1935.

rant proving up and reverted to the Government after a year or two of discouragement (Figure 7). The good crops of 1915 and 1916 checked abandonment temporarily. The drier-than-average years, 1917 to 1922, coupled with the break in farm prices forced a 22 per cent abandonment of the farms in the five-year period 1921 to 1925, most of these occurring in 1921 and 1922.

Table 20 shows that 46 per cent of the abandonments have occurred within the last five years. The average number of years since abandonment was 7·6. The reason most frequently given for this is that an abnormal period of drought has obtained in the district since 1928. Exceptional drought would not appear to be the chief reason for abandonment, but rather the inability to make farming pay in a normally dry climate. As long as wheat was being grown on virgin land obtained for homestead fees only, under conditions of better than average rainfall and sold at high prices, farmers were in most cases successful. Unfortunately grasshoppers, cutworms, weeds, and the loss of soil fibre in addition to the return of dry and normal years are now major factors in reduced yields.

TABLE 20.—DATES OF ABANDONMENT OF FARMS, LOMOND DISTRICT OF ALBERTA

—	Number of farms	Percentage	Cumulative percentage
1910–1920	18	16	16
1921–1925	23	22	38
1926–1930	18	16	54
1931–1935	50	46	100
Total	109	100	100

Significance of Size of Farm.—During the settlement period the quarter-section (160 acres) was the predominant size of farm. Many homesteaders acquired an additional quarter-section by pre-emption. The operators remaining gradually obtained other farms as the unsuccessful moved out. However, the fact that the remaining operators were ultimately unsuccessful may explain why the farms were little larger at the time of abandonment than they were originally.

In the area of scanty rainfall, successful farms are usually larger than those operated in more humid areas. The average size of the Lomond abandoned farms was only 273 acres. Fifty-four per cent of the farms when abandoned were only quarter-sections (160 acres), 29 per cent were half-sections and 6 per cent three-quarters. Only 11 per cent were as large as a section (640 acres) and none was greater. One of the contributing causes for abandonment was that these farms were not of optimum size.

Fig. 8.—The new settler coming in to fine sand blow-out country east of Carmangay. Alberta, 1935.

Present Occupation.—Seventy-two per cent of the 126 operators are still farming elsewhere, while only 15 per cent are engaged in occupations other than farming. The remainder are either retired, unemployed, or deceased. The fact that nearly three-quarters of the former operators are farming elsewhere is indicative that under present conditions they are better able to adjust themselves to farming than to other vocations. It is significant only a small minority chose the alternative of urban occupations.

Recurrence of Settlement.—Few if any of the abandoned farms of the Lomond district are in the long run capable of supporting wheat-growing as a major enterprise. However, because wheat-growing has been successful in exceptional years, other operators will again be attracted to these farms when a combination of unusually favourable circumstances occurs. (Figure 8.)

AGRICULTURAL AND LAND ORGANIZATION

Utilization of Land

The material which follows will be presented with the object of defining the intensity of the use of land from the western side of the Vulcan district to the eastern side of the Lomond district. The major difference between the agriculture of the two districts was in the relative application of labour and machinery to land. In the Vulcan district generally it was apparent that the

farm operator spent more time and used more equipment per acre with profit than did the farmer on the lighter soil in the Lomond district. The same applies to the individual soil classes within each district. The application of labour and capital to land was greater on the silt loams than on the fine sands. To decide the amount of these factors to combine with his land unit was the chief problem confronting the operator.

Size of Farm and Land Use.—The southern dry area of Alberta is essentially one of relatively extensive farming practices as contrasted with the more intensive mixed farming of the central and northern section of the Province. Only those enterprises which required the use of much land in relation to labour and capital were found in the south. This extensive use of land is one which lends itself very well to the production of wheat or of sheep or horses. The natural factors of precipitation, soil and climate were found to be such that very intensive use of the land was decidedly unprofitable. This contrast, however, is between the northern sections of the province and the prairie region of the south. Within the prairies are to be found fairly distinct farm practices judged by the criterion of intensity. The lesser value of the Lomond land and its lighter nature were responsible for a system economizing labour and capital. The first few years of settlement proved that the Lomond district could not be worked as intensively as that of Vulcan and as a consequence farms increased more in size and, except for prosperous times, much less machinery and labour was used on them.

Figures on size of farm give some indication of the relatively extensive manner in which land was operated. The average size of farm in the Vulcan area was 726 acres and that of Lomond was 753 acres. When leaseland is added to these figures, the totals become 758 and 889 acres, respectively. The average farm in Alberta as a whole was 400 acres.[1] The most common size of farm for both Vulcan and Lomond districts was that of three or four quarter-sections. (See Table 21.) A slightly larger proportion of the farms were found on a full section or less, than on farms of over one section. Very few (4 per cent) in Vulcan and (3 per cent) in Lomond were found on only one quarter-section, or 160 acres. Some farmers operated as much as 7 sections or 4,480 acres, which was considered a very extensive holding. The specialized type of farming and the nature of the machinery used for wheat farming made such large units practicable in this area. In more intensively farmed areas they are seldom found.

Tables 22 and 23 will serve to point out the degree of specialization which was carried on in these two wheat areas. Wheat and summer-fallow accounted for 75 per cent of the occupied acreage in Vulcan and for 49 per cent in Lomond. Considering the fact that wheat and summer-fallow land were both used in the production of wheat, and also that only 85 per cent of the land was improved in Vulcan and 66 per cent in Lomond, it is easily recognized how large a part this one commodity plays in the utilization of land in these prairie areas.

TABLE 21.—DISTRIBUTION OF FARMS ACCORDING TO SIZE OF FARM FOR THE VULCAN-LOMOND AREA OF ALBERTA, 1935

Occupied quarters	Vulcan		Lomond	
	Number of farms	Percentage	Number of farms	Percentage
1	10	4	8	3
2	49	21	46	18
3 and 4	82	36	103	39
5 and 6	49	21	54	21
7 and 8	21	9	29	11
9 and over	21	9	21	8
All farms	232	100	261	100

[1] Census of Alberta, 1931.

An interesting fact brought to light by Tables 22 and 23 is the much greater proportion of improved land in Vulcan than in Lomond. The Lomond farmers required larger acreages of wild pasture to maintain their work horses and live stock. This accounted for some of the difference, although the permanently idle or eroded land was responsible for a larger proportion of unimproved acreage in Lomond than in Vulcan.

The operators of the smaller farms, in an attempt to gain some income, had larger proportions of their acreages in wheat than those on the larger farms. As a consequence, the smaller farms had the lesser percentage in summer-fallow. The occupied farm land in the Vulcan district was only slightly less than that in Lomond but leaseland was more easily obtained in the latter district.

TABLE 22.—AVERAGE DISTRIBUTION OF LAND USE ACCORDING TO SIZE OF FARM IN THE VULCAN DISTRICT OF ALBERTA, 1935

Quarters occupied	1	2	3 and 4	5 and 6	7 and 8	9 and over	All farms	Per cent of total occupied
Number of farms..	10	49	82	49	21	21	232	232
	acres	acres	acres	acres	acres	acres	acres	per cent
Wheat	81	131	240	399	500	777	316	43
Oats	7	21	23	26	45	70	29	4
Rye	2	2	6	8	16	22	8	1
Barley	4	1	2	6	9	15	5	1
Legumes and grasses	3	2	2	4	3	4	2	*
Idle cropland	.....	9	6	17	36	8	11	2
Summerfallow[1]	31	88	174	298	364	611	232	32
Other improved	7	12	10	14	21	45	16	2
Total improved	135	266	463	772	994	1,552	619	85
Wild pasture	20	33	58	78	180	375	95	13
Permanently idle	.....	5	10	2	2	1	5	1
Waste	5	6	5	6	16	2	7	1
Total unimproved	25	44	73	86	198	378	107	15
Total occupied	160	310	536	858	1,192	1,930	726	100
Leaseland	.....	3	2	7	30	297	32	
Total farm area	160	313	538	865	1,222	2,227	758	

* Less than 0·5 per cent.
[1] Also a small amount of breaking included.

TABLE 23.—AVERAGE DISTRIBUTION OF LAND USE ACCORDING TO SIZE OF FARM IN THE LOMOND DISTRICT OF ALBERTA, 1935

Quarters occupied	1	2	3 and 4	5 and 6	7 and 8	9 and over	All farms	Per cent of total occupied
Number of farms..	8	46	103	54	29	21	261	261
	acres	acres	acres	acres	acres	acres	acres	per cent
Wheat.....	56	110	184	281	367	561	237	32
Oats.....	4	14	17	21	31	28	20	3
Rye.....	7	11	13	41	39	97	28	4
Barley.....	.....	2	1	1	1	1	1	*
Legumes and grasses.....	.....	*	*	*	1	.....	*	*
Idle cropland.....	5	35	54	89	121	200	75	10
Summerfallow[1]....	25	43	100	124	204	381	126	17
Other Improved..	3	5	3	7	8	12	7	*
Total improved...	100	220	372	564	772	1,280	494	66
Wild pasture.....	60	89	178	282	333	655	236	31
Permanently idle..	.....	4	8	10	72	81	20	3
Waste.....	.....	5	.....	1	11	9	3	*
Total unimproved.	60	98	186	293	416	745	259	34
Total occupied....	160	318	558	857	1,188	2,025	753	100
Leaseland.....	80	38	65	181	110	640	136	
Total farm area..	240	356	623	1,038	1,298	2,665	889	

* Less than 0·5 per cent.

[1] Also a small amount of breaking included.

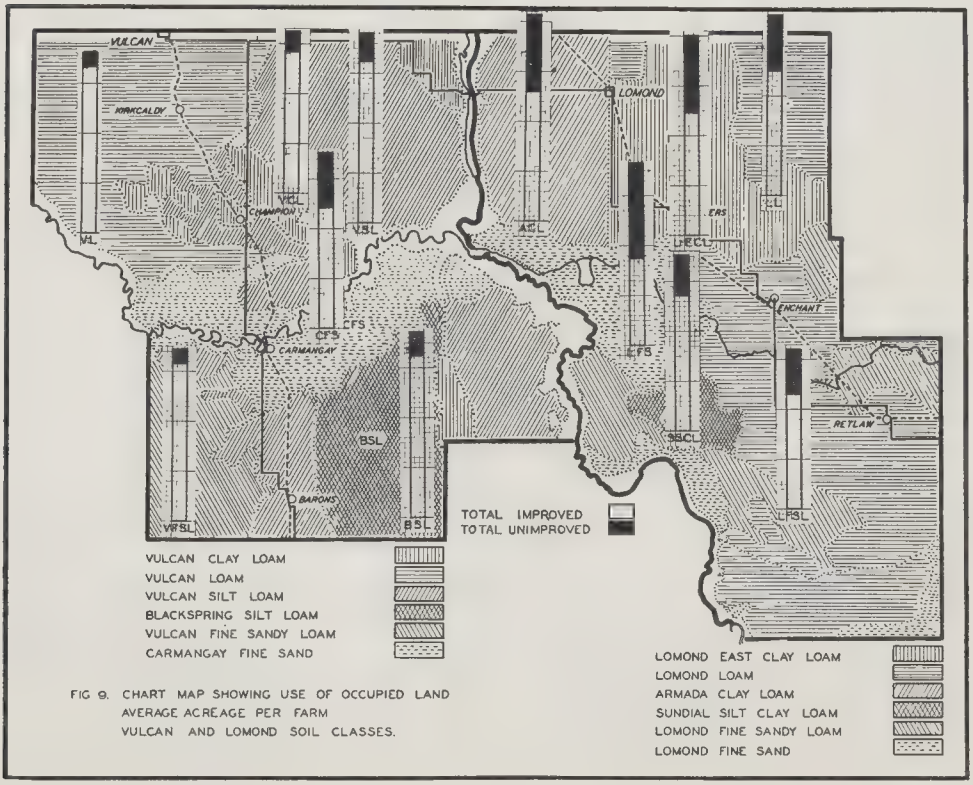

FIG 9. CHART MAP SHOWING USE OF OCCUPIED LAND AVERAGE ACREAGE PER FARM VULCAN AND LOMOND SOIL CLASSES.

TABLE 24.—AVERAGE DISTRIBUTION OF LAND USE ACCORDING TO SOIL TYPE IN THE VULCAN DISTRICT OF ALBERTA, 1935

Soil type	Number of farms	Wheat	Oats	Barley	Rye	Legumes and grasses	Summer fallow[1]	Idle	Improved pasture	Farmstead	Total improved	Wild pasture	Permanently idle	Waste	Total unimproved	Total occupied	Leaseland
		acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres
Blackspring silt loam	21	339	30	5	3	1	258	.....	7	6	649	88	.....	6	94	743	.....
Vulcan fine sandy loam	17	331	22	1	22	1	242	6	7	5	637	45	6	5	56	693	.....
Vulcan silt loam	75	338	31	7	2	2	251	4	9	8	652	108	*	2	110	762	43
Vulcan loam	52	374	30	4	2	2	251	*	7	7	677	46	.....	4	50	727	.....
Vulcan clay loam	28	274	28	6	12	2	238	4	7	6	577	77	.....	3	80	657	34
Carmangay fine soil	39	206	27	2	21	5	150	55	14	6	486	176	29	17	222	708	86
All farms	232	316	29	5	8	2	232	11	9	7	619	95	5	7	107	726	32

TABLE 25.—AVERAGE DISTRIBUTION OF LAND USE ACCORDING TO SOIL TYPE IN THE LOMOND DISTRICT OF ALBERTA, 1935

Soil type	Number of farms	Wheat	Oats	Barley	Rye	Legumes and grasses	Summer fallow[1]	Idle	Improved pasture	Farmstead	Total improved	Wild pasture	Permanently idle	Waste	Total unimproved	Total occupied	Leaseland
		acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres	acres
Sundial silt clay loam	13	320	23	*	20	1	152	24	*	8	548	157	*	*	157	705	74
Armada clay loam	46	256	18	1	1	*	229	9	2	5	521	306	2	*	308	829	45
Lomond-east clay loam	62	228	15	2	22	*	162	60	1	6	496	252	47	8	307	803	116
Lomond loam	97	239	22	1	40	*	89	110	*	5	506	210	9	*	219	725	132
Lomond fine sand loam	26	244	24	*	46	1	39	105	*	5	464	175	5	*	180	644	92
Lomond fine sand	17	143	15	1	31	1	43	111	1	6	352	289	84	11	384	736	593
All farms	261	237	20	1	28	*	126	75	1	6	494	236	20	3	259	755	136

* Less than ·5 per cent.
[1] Includes a small amount of breaking.

Soil and Land Use.—The influence of soil on the use of land is brought out by Tables 24 and 25. In the Vulcan district, variations in occupied acreages were not very great between the various soil belts but the proportion of land improved showed some interesting contrasts (Figure 9). In the least productive Carmangay fine sand the improved acreage was only 486 acres as compared with the loam, silt loams and fine sandy loam each of which had approximately 650 acres of improved land. The clay loam was intermediate between these two extremes. Much the same relationship was found between the fine sand in the Lomond district and the other soils with a less striking contrast.

Of further interest was the difference in the proportion of land in summer-fallow. In the Vulcan district on the fine sand farms only 21 per cent of the occupied acreage was in summer-fallow as compared with approximately 32 per cent in all other soil belts. In the Lomond district on none of the soil belts was there more than 28 per cent in summer-fallow with only 6 per cent on each of the fine sand and fine sandy loam. Idle cropland accounted for some of the difference since those soils with the least summer-fallow had also the most idle cropland. Land permanently idle from erosion was also greatest where the summer-fallow was least. The small amount of summer-fallowing done on the least productive soil was due to two factors: soil drifting was a greater problem and therefore increased the cost and decreased the effectiveness of the summer-fallow; and the extremely low yields and unprofitable returns lowered the power and machinery capacity of these farmers to such an extent that only a limited amount of land could be worked.

Tenure and Land Use.—In both districts the largest farms were operated by those who owned a part of their land and also rented a part (Table 26). Owners in Vulcan had slightly smaller farms than the tenants but the opposite was true of the Lomond district where the purchase price of land was lower and straight renting was not so common.

TABLE 26.—AVERAGE DISTRIBUTION OF LAND USE ACCORDING TO TENURE IN THE VULCAN-LOMOND DISTRICT OF ALBERTA, 1935

Tenure	Vulcan				Lomond			
	Owners	Part owners	Tenants	All farms	Owners	Part owners	Tenants	All farms
Number of farms	100	82	50	232	102	114	45	261
	acres	acres	acres	acres	acres	acres	acres	acres
Wheat	254	418	272	316	194	303	173	237
Oats	28	33	23	29	19	24	11	20
Barley	5	6	5	5	1	1	1	1
Rye	6	10	9	8	21	35	26	28
Legumes and grasses	3	2	1	2	*	*	.....	*
Summerfallow[1]	179	313	208	232	99	173	66	126
Idle	8	14	14	11	61	95	58	75
Improved pasture	8	13	4	9	1	1	*	1
Farmstead	6	7	6	7	6	6	4	6
Total improved	497	816	540	619	402	638	339	494
Wild pasture	57	146	87	95	165	325	171	236
Permanently idle	4	2	15	5	25	21	9	20
Waste	5	8	4	7	2	3	4	3
Total unimproved	66	156	106	107	192	349	184	259
Total occupied	563	972	646	726	594	987	523	753
Leaseland	6	84	.....	32	60	240	46	136
Total farm area	569	1,056	646	658	654	1,227	569	889

* Less than ·5 per cent.
[1] Also a small amount of breaking.

Only minor differences were found between the three tenures in the proportion of the farm which was improved. Of significance, however, was the fact that in Vulcan, the proportions of land in summer-fallow were 32 per cent throughout, although tenants were often considered to be less scrupulous about their farming methods than the owners. In the Lomond district where tenancy is often a catch-as-catch-can arrangement, a smaller percentage of the farm was being summer-fallowed by the tenants than by the owners or part owners (13 per cent as compared with 17 per cent and 18 per cent respectively). Most of the tenants were on the poorer soils in the Lomond district which may explain the difference in the percentage of summer-fallow.

Values of Farm Property

One index of the relative use of two factors of production, land and capital, is found in their money valuations. Tables 27 and 28 present the values of various items of farm property in the Vulcan and Lomond areas.

Average total capitalization in Vulcan was $15,353 as compared with $6,574 in Lomond. The large part of the difference was in land values. Vulcan land values were per farm over three times those of Lomond. The values per occupied acre were in much the same proportion: i.e. $14.05 and $4.08, respectively. Only in the average value of live stock was there a larger amount invested per farm in Lomond than in Vulcan, buildings, machinery and feed and supplies on hand were much higher in the latter than in the former. The higher capitalization of machinery in Vulcan is an index of the relatively more intensive farm operations. In the Vulcan district the value of machinery per acre of cropland was $3.17 as compared with $2.69 in the Lomond district. Of course, it must be kept in mind that 10 per cent of the Lomond cropland was left idle or " resting " each year and only 2 per cent in Vulcan, and no machinery was used on this idle land. In years of high yields and high prices, and consequent freer credit, both districts tended to expand the amount of their machinery. From field observations one would conclude that in the prosperous years of 1915-18 and 1927-28 both districts had more machinery per acre of cropland (in terms of value), and the value was more nearly alike than at present. Due, nevertheless, to lighter soil and lesser productivity, one would not expect, even in normal years, as intensive use of machinery in Lomond as in Vulcan.

In so far as the percentage values of various items of farm property were concerned, land was the largest factor throughout (66 per cent of the total in Vulcan and 47 per cent in Lomond); buildings comprised 16 per cent in Vulcan and 20 per cent in Lomond; machinery accounted for 12 per cent in Vulcan and 20 per cent in Lomond, live stock made up 5 per cent in Vulcan and 11 per cent in Lomond, and finally feed and supplies on hand were only 1 per cent in Vulcan and 2 per cent in Lomond.

The greater dependence of Lomond on live stock is one of the significant factors disclosed by Table 28. The greater part of the difference was accounted for by the added use of range land and range stock on the Lomond side of McGregor Lake. The attempt by the Lomond farmers to utilize their cheap land in order to supplement income during the years of low wheat yields and prices was one cause of the greater dependence on live stock. The industry was certainly not highly remunerative due to the great fluctuations in the supply of feed. It is of importance, though, that live stock can be used as a reserve to be sold off if necessary during years of depression. This is not true of wheat which cannot be realized upon during periods of low yields and prices.

TABLE 27.—AVERAGE DISTRIBUTION OF FARM INVENTORY VALUES ACCORDING TO SIZE OF FARM (OCCUPIED ACREAGE) IN THE VULCAN DISTRICT OF ALBERTA, 1935

Number of quarters	Number of farms	Land	Buildings	Machinery	Livestock	Feed and supplies	Total farm capital
		$	$	$	$	$	$
1	10	1,489	706	356	246	13	2,810
2	49	3,861	1,216	799	483	38	6,397
3 and 4	82	7,306	2,090	1,487	586	138	11,607
5 and 6	49	12,161	2,940	2,495	668	164	18,434
7 and 8	21	15,512	2,893	3,061	1,020	166	22,652
9 and over	21	30,582	5,188	4,403	1,782	406	42,361
All farms	232	10,203	2,380	1,912	714	144	15,355

TABLE 28.—AVERAGE DISTRIBUTION OF FARM INVENTORY VALUES ACCORDING TO SIZE OF FARM (OCCUPIED ACREAGE) IN THE LOMOND DISTRICT OF ALBERTA, 1935

Number of quarters	Number of farms	Land	Buildings	Machinery	Livestock	Feed and supplies	Total farm capital
		$	$	$	$	$	$
1	8	515	519	448	368	2	1,852
2	46	1,074	759	500	457	6	2,796
3 and 4	103	2,420	1,105	1,028	600	117	5,270
5 and 6	54	3,543	1,566	1,406	889	84	7,488
7 and 8	29	4,889	2,044	2,080	1,030	225	10,268
9 and over	21	7,941	2,388	3,429	1,723	101	15,582
All farms	261	3,075	1,329	1,306	766	98	6,574

FIG. 10.—Russian thistles being cut for winter fodder. The few remaining heads of wheat give it subsistence value when other feed is not procurable—Lomond east clay loam. Alberta, 1935.

Feed and supplies were relatively small items in both districts, especially in the dry area. Except for a few farms with quite large amounts of wheat on hand, the average farmer in Lomond had very little in reserve for the following year. The difference between the various soil belts was very great as is shown in Table 29. A government feed and seed relief policy does not encourage

building of reserves. It is significant here to point out that the farmers of Vulcan averaged $13 per farm for feed and supplies on hand on the quarter-section holdings and $406 per farm on holdings over 2 sections; in Lomond the average amount varied from $2 per farm on the quarter-section holdings to $225 per farm on the 7 and 8 quarter-section farms and $101 on those over 8 quarters. It was found that of the 261 farms visited in the Lomond area, 122 had no feed or seed on hand at the time the study was made. A reserve of feed is necessary but unfortunately it is too often lacking. (Figure 10.)

Size of Farm and Farm Property Values.—The distribution of farm property values according to size of farm, showed some interesting trends. (See Tables 27 and 28.) In both Lomond and Vulcan the percentage of total capitalization in land increased from the small farms to the larger ones and the proportion in buildings decreased. In other words, for the larger farms the fixed charges for buildings, in interest and depreciation were much less proportionately to other costs. The same was not true for machinery and live stock.

The lowest percentage use of machinery, as compared with other factors of production, was found on the largest farms. On the farms over two sections, the proportion of total capitalization in machinery was only 11 per cent as compared with 13 per cent for one section, or less and 14 per cent for those between one and two sections. Presumably the very largest farms had the least proportionate fixed costs in machinery. They were thus able to use this factor the most economically. This was the picture found in an area of specialized extensive farming where credit had been extended substantially in years past. In the Lomond area, where credit had been extended only at intervals and meagrely during the previous twenty years, the very large operators were the only ones able to obtain sufficient credit to buy substantial amounts of machinery. As a consequence, it was on the large farms that the operators were able to obtain optimum amounts of machinery. On the quarter-section farms were found the largest percentage of machinery value in relation to total capitalization. On practically all farms except the very largest, a minimum of machinery was in use. For years previous to the study, the Lomond farmers were unable to make purchases of new machinery and only in the case of the very large farms was there any successful attempt to keep equipment in shape. For that reason it was not possible to discover from the figures, taken in a depression year and after a series of low yields and prices in Lomond, what might be the proportion of machinery economically useful on each size of farm.

TABLE 29.—AVERAGE DISTRIBUTION OF FARM INVENTORY VALUES ACCORDING TO SOIL IN THE VULCAN DISTRICT OF ALBERTA, 1935

Soil Type	Number of farms	Land	Buildings	Machinery	Livestock	Feed and supplies	Total farm capital
		$	$	$	$	$	$
Blackspring silt loam	21	12,224	2,814	2,617	679	246	18,580
Vulcan fine sandy loam	17	8,737	1,877	1,777	501	114	13,006
Vulcan silt loam	75	11,867	2,951	2,222	881	188	18,109
Vulcan loam	52	12,074	2,489	2,086	557	202	17,408
Vulcan clay loam	28	10,237	1,916	1,556	747	22	14,478
Carmangay fine sand	39	4,033	1,455	1,019	693	26	7,226
All farms	232	10,203	2,380	1,912	714	144	15,353

The proportion of live stock value was highest on the smallest farms in both districts. In Vulcan the percentage varied from 9 per cent on the quarter-section farms to 4 per cent on the farms over 2 sections; and in Lomond from 20 per cent on the quarter-section farms to 10 per cent and 11 per cent on

the largest farm groupings. Horse-power and machinery were not used to capacity on the smaller farms. Further, the larger farms tended to use tractors for power instead of horses, thus decreasing the proportion of live stock on the larger farms. The same applies to the difference in proportion of live stock found in Vulcan and in Lomond. A larger proportion of farms, within the same size groupings, used tractors in Vulcan than was the case in Lomond.

TABLE 30.—AVERAGE DISTRIBUTION OF FARM INVENTORY VALUES ACCORDING TO SOIL IN THE LOMOND DISTRICT OF ALBERTA, 1935

Soil Type	Number of farms	Land	Buildings	Machinery	Livestock	Feed and supplies	Total farm capital
		$	$	$	$	$	$
Sundial silt clay loam....	13	4,109	2,500	1,791	660	726	9,786
Armada clay loam.....	46	5,668	1,160	1,647	747	22	9,244
Lomond-east clay loam....	62	2,542	1,212	1,162	680	125	5,721
Lomond loam.....	97	2,714	1,373	1,262	747	51	6,147
Lomond fine sandy loam...	26	1,827	1,430	1,140	775	17	5,189
Lomond fine sand.....	17	1,184	910	1,033	1,309	110	4,546
All farms.....	261	3,075	1,329	1,306	766	98	6,574

Soil and Farm Property Values.—Tables 29 and 30 show the relative use of the factors of production in the various soil belts of Vulcan and Lomond. The great variations in land values between the two districts has already been pointed out. Between the various soil belts within each district, the variations were even more pronounced. The farmers' estimate of the value of land per farm on the Carmangay fine sand was only $4,033 as compared with that of the best soil in the district, Blackspring silt loam, $12,224. The difference was not as great per acre since the farms of the fine sand ($5.70 per acre) were not quite as large as those on the Blackspring silt loam ($16.45 per acre). However, the difference was at least an indication that land values had taken up, at least partially, the differences in productivity of the two belts. This Carmangay fine sand was of such a light nature that the Municipal District had been continually

TABLE 31.—AVERAGE DISTRIBUTION OF FARM INVENTORY VALUE ACCORDING TO TENURE IN THE VULCAN DISTRICT OF ALBERTA, 1935

Tenure	Number of farms	Land	Buildings	Machinery	Livestock	Feed and supplies	Total farm capital
		$	$	$	$	$	$
Owners.....	100	7,484	2,383	1,726	679	130	12,402
Part owners.....	82	14,749	2,775	2,526	887	216	21,153
Tenants.....	50	8,185	1,723	1,279	502	52	11,741
All farms.....	232	10,203	2,380	1,912	714	144	15,353

drawn upon for relief. The question arises, then, as to whether an area regularly receiving relief could be considered as having any value other than a nominal sum. In the Lomond district similar relationships were found between the heavier and lighter soils. While farm property values are largely dominated by land values, the figures for buildings and machinery add to the evidence of greater intensity of use of the Blackspring silt loam in Vulcan and the Sundial silt clay loam in Lomon. The value of buildings in the former soil belt was $2,814 as compared with only $1,455 in the Carmangay fine sand. In the Lomond district the farms in the Sundial area had an average building value of $2,500 as compared with only $910 in those of the Lomond fine sand. Machinery values

averaged $2,617 per farm on the Blackspring ridge and only $1,019 on the Carmangay fine sand. In the Lomond district, the values were $1,791 on the farms of the Sundial silt clay loam and $1,033 on the farms of the Lomond fine sand. Prolonged inability to replace farm buildings and equipment on the very light soils was largely responsible for the great differences in their intensity of application.

TABLE 32.—AVERAGE DISTRIBUTION OF FARM INVENTORY VALUE ACCORDING TO TENURE IN THE LOMOND DISTRICT OF ALBERTA, 1935

Tenure	Number of farms	Land	Buildings	Machinery	Livestock	Feed and supplies	Total farm capital
		$	$	$	$	$	$
Owners	102	2,356	1,488	1,311	662	160	5,977
Part owners	114	4,216	1,425	1,584	976	77	8,278
Tenants	45	1,818	724	588	470	9	3,609
All farms	261	3,075	1,329	1,306	766	98	6,574

Tenure and Farm Property Values.—The investment in farms operated by part owners was much larger in both districts than those operated by either owners or tenants. The larger size of farm operated by the part owners was chiefly responsible for higher farm property values of this group especially in land, machinery and live stock. Tables 31 and 32 giving property values according to tenure, also provides evidence that the buildings on the farms of tenants are inferior to those of either owners or part owners. The claim of tenant insecurity is borne out by the fact that feed and supplies on hand were much lower for this group than for the others. In Lomond district, an average of only $9 worth of feed and supplies on hand were found at the time of the survey as compared with $160 on the farms of owners. In the Vulcan district the same relationship was found although both figures were higher.

FIG. 11.—Stockwatering dam on the Vulcan silt loam. Alberta, 1935.

Live Stock

The two districts included in the survey were utilized for live stock grazing in the years before homesteading commenced. This was the most extensive type of agriculture. Cattle and horses were the only live stock raised until about 1904 in Vulcan and 1909 in Lomond when the country was broken up into homesteads. Subsequently, almost the entire area was developed under a more

intensive system of farming in which each individual operator worked one or two quarter sections of land with a few horses, cows, hogs and poultry; a few farmers also had small flocks of sheep but with wheat as the main enterprise. However, during and shortly after the war the size of the farm increased greatly with more extensive use of machinery and more land per man. Wheat became practically the single source of revenue at the expense of live stock. This type of agriculture continued in the Vulcan district to the time of the study except that when the price of wheat was low more attention was paid to the raising of hogs and milking of cows. In Lomond, wheat farming continued but with the addition on many farms of grazing live stock: sheep, cattle or horses. This development in the Lomond district followed the farm abandonment of 1921-24 and 1930-34 which left a large amount of vacant land for grazing purposes. It was a return to the original extensive type of agriculture.

The census reports by municipalities, Table 33, show a decrease in the number of horses from 1916 to 1931 in both the areas. This was probably due to an increase in the number of tractors used by the farmers during the same period. In Lomond it was partially due to a decrease in the crop acreage through abandonment of land. The number of cattle, during the period 1916 to 1931 decreased in the Vulcan district, yet increased in the Lomond district. In the former area during this period land was broken up for wheat farming, leaving less land available for grazing, while in the latter area some of the land was abandoned as cropland and was used only for grazing.

TABLE 33.—NUMBERS OF LIVE STOCK IN SPECIFIED MUNICIPALITIES IN THE VULCAN-LOMOND DISTRICT OF ALBERTA, 1916-31

Class of livestock	Vulcan Municipalities 97, 98, 157, 158		Lomond Municipalities 96, 126, 127, 156	
	1916	1931	1916	1931
	No.	No.	No.	No.
Horses	17,053	13,272	11,214	8,693
Cattle	22,112	12,755	8,138	11,996
Sheep	1,069	5,166	240	23,334
Hogs	16,127	25,364	6,055	6,936
Poultry	.....	150,324	.....	63,051

The number of sheep increased in both areas over the 15-year period of 1916 to 1931. In the Lomond district the increase was very marked, a sign of returning confidence in the use of the range and more extensive agriculture. Since farms had been abandoned in the Lomond area, sheep ranchers moved in on the abandoned areas for summer grazing. In addition, some of the farmers within the area shifted from specialized wheat growing into a semi-farming and semi-ranching system. In the Vulcan district most of the sheep were small farm flocks. Their numbers were not significant. Here was the sign of a shift from exclusive wheat growing to a more diversified type of farming.

Hogs were more prevalent in the Vulcan district, but increased in numbers in both areas during the 15-year period. In 1916 and the few boom years that followed, wheat farming was very profitable, and gave little encouragement to hog raising. Tables 34 and 35 give the average number and value of live stock for the farms of the survey in 1935. Over 90 per cent of the operators of both areas had horses, but the number per farm was less in the Vulcan area where tractors were more common. The Lomond district suffered greatly from lack of efficient work horses. Shortage of winter feed reduced the horses' physical condition and on some farms deaths were reported. These were caused by the animals grazing on grass so short that an excessive amount of soil accumulated in their stomachs.

Over 90 per cent of the farms of both areas had some cattle. The average number per farm having cattle was 13 for Vulcan as compared with 16 for Lomond. This was probably due to the larger amount of unimproved or pasture land in the Lomond area.

TABLE 34.—AVERAGE NUMBERS AND VALUES PER FARM OF SPECIFIED LIVE STOCK CLASSES IN THE VULCAN DISTRICT OF ALBERTA, 1935

Class	Number of farms having stock	Average per farm having stock			Average per family all farms—		Per cent of total livestock value
		Number	Value	Value per unit	Number	Value	
		No.	$	$ cts.	No.	$	Per cent
Horses	209	8	402	50 22	7	362	51
Cattle	219	13	238	18 40	12	225	31
Sheep	24	83	278	3 34	9	29	4
Hogs	160	17	105	6 09	12	72	10
Poultry	224	101	27	27	97	26	4
Other livestock	.....	.....	.....	.....	.....	.....	.....
All farms	232	.....	.....	.....	.....	714	100

TABLE 35.—AVERAGE NUMBERS AND VALUES PER FARM OF SPECIFIED LIVE STOCK CLASSES IN THE LOMOND DISTRICT OF ALBERTA, 1935

Class	Number of farms having stock	Average per farm having stock			Average per family all farms—		Per cent of total livestock value
		Number	Value	Value per unit	Number	Value	
		No.	$	$ cts.	No.	$	Per cent
Horses	243	10	433	42 90	10	412	54
Cattle	232	16	286	17 86	14	254	33
Sheep	37	108	341	3 17	15	48	6
Hogs	131	8	50	6 51	4	25	3
Poultry	250	83	21	0 26	80	20	3
Other livestock	1	.....	6	.....	.....	6	1
All farms	261	.....	.....	.....	.....	766	100

Sheep were found on comparatively few farms of both districts. Approximately 10 per cent of the farms of the Vulcan district had sheep, while in the Lomond district 13 per cent of the farms had them. The size of the flock for those farms having sheep and for all farms was considerably greater for the Lomond district than for the Vulcan district. The variability was also greater for the Lomond area, there being some large flocks containing as many as 1,000 head.

In the Vulcan district 70 per cent of the farmers reported hogs, while in the Lomond area only 53 per cent of the farmers kept hogs. The number per farm of those farmers keeping hogs was 17 in the Vulcan district, and 8 in the Lomond district. In the Lomond district hogs were kept mainly for household consumption, while in the Vulcan district they were kept both for home consumption and to supplement the farm income, especially during periods of low wheat prices.

Poultry were found on practically all farms of both districts, and included chickens, turkeys, ducks and geese. There were a larger number per farm in the Vulcan district, which was also probably due to the greater ease in obtaining feed and the more permanent nature of the farm families.

The severity of the drought during the past several years forced some farmers to sell all of their breeding stock due to lack of feed and water. This was done at a time of relatively low prices for live stock, especially cattle, and therefore entailed a substantial loss to many operators. In those cases where any reserve feed was available, the farmers held what stock they had, expecting at some future date a more remunerative return for them. This often meant the purchasing of more feed, overgrazing of pastures or application for feed and fodder relief from the government. The two forces of extreme drought and very low price worked in opposite directions but certainly the net effect during 1934-35 was to decrease the live stock inventory, at least temporarily.

Size of Farm and Live Stock.—In tables 36 and 37 the numbers of the various classes of live stock are shown in relation to occupied quarter-sections. As might be expected, the numbers of each class except poultry increased with the size of the land unit. However, with the exception of sheep, the increase was not in proportion to the increase in occupied acreage, and even less in proportion to the total farm area including leaseland since the large farms held more acres under lease. An exception to the general trend of increasing number of live stock was found in the Lomond district among the operators on one-quarter section. One operator in this group had quite an extensive holding of leaseland and with it a relatively large band of sheep. Otherwise the trend upwards in numbers of live stock from the small to the large farms is quite regular. Since the larger farms were most extensively operated, the reason for less than proportionate increase in numbers of live stock is apparent for horses for power, cattle for milking purposes, hogs and poultry. Sheep are largely of a range type and naturally increased rapidly as the farm increased in size.

TABLE 36.—AVERAGE NUMBERS OF VARIOUS CLASSES OF LIVE STOCK ACCORDING TO SIZE OF FARM IN THE VULCAN DISTRICT OF ALBERTA, 1935

(All Farms)

Number of quarters	1	2	3 and 4	5 and 6	7 and 8	9 and over	All farms
	No.	No.	No.	No.	No.	No.	No.
Number of farms	10	49	82	49	21	21	232
Horses	2	6	6	7	9	14	7
Cattle	4	7	9	11	20	35	12
Sheep	*	*	2	*	22	63	9
Hogs	1	8	9	13	22	19	12
Poultry	92	107	84	95	110	118	97

* Less than ·5 per cent.

TABLE 37.—AVERAGE NUMBERS OF VARIOUS CLASSES OF LIVE STOCK ACCORDING TO SIZE OF FARM IN THE VULCAN DISTRICT OF ALBERTA, 1935

(All farms)

Number of quarters	1	2	3 and 4	5 and 6	7 and 8	9 and over	All farms
	No.	No.	No.	No.	No.	No.	No.
Number of farms	8	46	103	54	29	21	261
Horses	5	6	8	12	11	18	10
Cattle	5	8	10	18	20	36	14
Sheep	20	5	8	3	22	95	15
Hogs	.....	1	4	5	5	7	4
Poultry	49	64	76	98	84	89	80

TABLE 38.—NUMBERS OF LIVE STOCK ACCORDING TO SOIL TYPE IN THE VULCAN DISTRICT OF ALBERTA, 1935

Soil type	Number of farms	Horses		Cattle		Sheep		Hogs		Poultry	
		Number of farms having horses	Number per farm	Number of farms having cattle	Number per farm	Number of farms having sheep	Number per farm	Number of farms having hogs	Number per farm	Number of farms having poultry	Number per farm
Blackspring silt loam	21	20	9	20	11	2	1	16	21	21	119
Vulcan fine sandy loam	17	11	7	13	10	2	56	11	15	16	103
Vulcan silt loam	75	70	9	75	16	11	14	55	21	74	106
Vulcan loam	52	47	6	48	10	4	7	32	15	48	96
Vulcan clay loam	28	26	8	27	11	1	464	21	16	27	111
Carmangay fine sand	39	35	8	32	15	4	309	25	13	38	77
All farms	232	209	8	215	13	24	83	160	17	224	101

TABLE 39.—NUMBERS OF LIVE STOCK ACCORDING TO SOIL TYPE IN THE LOMOND DISTRICT OF ALBERTA, 1935

Soil type	Number of farms	Horses		Cattle		Sheep		Hogs		Poultry	
		Number of farms having horses	Number per farm	Number of farms having cattle	Number per farm	Number of farms having sheep	Number per farm	Number of farms having hogs	Number per farm	Number of farms having poultry	Number per farm
Sundial silt clay loam	13	10	11	12	13	1	30	11	7	13	101
Armada clay loam	46	46	9	38	15	2	222	24	9	42	86
Lomond east clay loam	62	58	9	56	15	5	93	21	7	60	67
Lomond loam	97	90	11	85	16	16	41	52	9	94	82
Lomond fine sandy loam	26	25	12	24	16	5	25	16	7	26	94
Lomond fine sand	17	14	11	17	26	8	284	7	2	15	110
All farms	261	243	10	232	16	37	108	131	8	250	83

Soil and Live Stock.—The numbers of the various types of live stock per farm are an indication of the relative intensity of land use. (Tables 38 and 39.) The more extensive system of farming on the lighter soils tended to encourage the use of range live stock while the heavier soils tended to utilize the type of stock which is more dependent on concentrates for nutrients and requires more labour in its production. Tables 38 and 39 show the distribution of numbers of live stock per farm in the various soil types. The average numbers of horses did not vary greatly. The same was more or less true of cattle except for the much higher average number in the very light Lomond fine sand as compared with all other groups. The average numbers of sheep were very high on the fine sand farms and also on the clay loams adjacent to large tracts of sandy lease land. In both districts the lighter soils, the fine sands, ranked last in number of hogs per farm. The silt loams and to some extent the loams were at the top of the list. This seems to fit very well the picture of intensity,—where land is relatively cheap, the grazing live stock is found; where it is more productive and more expensive, the tendency is to be more economical in its use by having that type of live stock which requires less land and more labour per unit of output.

TABLE 40.—AVERAGE NUMBERS OF LIVE STOCK PER FARM ACCORDING TO TENURE IN THE VULCAN-LOMOND DISTRICT OF ALBERTA, 1935

Tenure	Vulcan				Lomond			
	Owners	Part owners	Tenants	All farms	Owners	Part owners	Tenants	All farms
Number of farms	100	82	50	232	102	114	45	261
Horses—								
Number farms having horses	91	74	44	209	94	111	38	243
Number per farm	8	9	7	8	10	12	7	10
Cattle—								
Number farms having cattle	96	77	46	219	82	110	40	232
Number per farm	12	16	9	13	16	18	10	16
Sheep—								
Number of farms having sheep	11	11	2	24	9	22	6	37
Number per farm	5	176	1	83	37	150	59	108
Hogs—								
Number farms having hogs	67	62	31	160	46	67	18	131
Number per farm	19	18	13	17	8	8	7	8
Poultry—								
Number farms having poultry	96	81	47	224	96	111	43	250
Number per farm	109	104	77	101	83	87	74	83

Tenure and Live Stock.—In general the part-owners were expanding their business and adjusting their units to prevailing conditions most rapidly. They had the largest farms and more live stock, especially sheep, than either the owners or the tenants (Table 40). Owner operators had the second largest number of live stock per farm and tenants the smallest number. However, the size of farm operated was ranked in the same order and may be the more important factor.

Machinery

The nature of the general farming practices in the dry prairie area with extreme fluctuations in production and price had a great influence on the use of machinery. During the periods of high net returns it became an established practice to use a large part of the surplus to replace and add to the equipment of the farm. During the year 1928 many hundreds of thousands of dollars worth of combines, tractors, binders, headers, ploughs and the like were sold to the farmers of these districts. In the seven succeeding years only a minimum was spent on large scale machinery. This same phenomenon occurred in the high price years of the war and the following post-war depression. With such sporadic purchase of machinery, it is obvious that periods of over-investment and under-investment in machinery must occur.

FIG. 12.—The largest combine in western Canada at work on the silt loam southwest of Retlaw, Alberta, 1935.

FIG. 13.—A relic of the days of bumper crops and big threshing gangs in the abandoned territory northeast of Lomond, Alberta, 1935.

One would expect the Lomond operators to use less machinery per acre of cropland than those of Vulcan because of the more extensive system of farming in the former district where the lighter soils are found. This is borne out by

the figures on value of machinery per acre of cropland which show an average of $3.17 in Vulcan and $2.68 in Lomond. However, in periods of high prices and high yields productivity in the Lomond district approached more closely that of the Vulcan district than it did in the poorer years. For this reason, and because net returns were even more closely related in the two districts in these good years, the machinery bought in each district was not greatly different in total per farm.

As a consequence the Lomond farmers often found themselves working with high priced machinery in years when it was not profitable to make intensive use of their land. Such a condition led to difficulty in Lomond. Many of the tractors which were used in the Lomond district in the 1927-28 prosperous years were still to be found on the farms but idle because of the unprofitability of using such equipment in an area of low average yields. Lack of credit facilities to finance the purchase of fuel and repairs was of course a factor of some importance as well.

The influence of the introduction of large scale machinery into the wheat growing areas cannot be neglected (Figures 12 and 13). The time since the use of the combine became more or less general, has been too short to estimate accurately its position in the future of western wheat production. However, in relation to this study of the Vulcan-Lomond area its effect is important. It was introduced at a time when a coincidence of high yields and high prices encouraged an increase in the size of farm and the cultivation of land formerly considered sub-marginal. Only optimum precipitation and optimum wheat prices could maintain these lands in cultivation. Subsequent abandonment is clear evidence of over-expansion. Farmers in the Vulcan district were able to maintain their equipment in a fair state of repair even during the depression but the farmers of the Lomond district were carrying on with their 1919 and 1928 purchases with little or no replacements.

TABLE 41.—AVERAGE NUMBERS OF SPECIFIED TYPES OF MACHINERY PER FARM IN THE VULCAN DISTRICT OF ALBERTA, 1935

Soil type	Number of farms	Number of autos	Number of trucks	Number of tractors	Number of combines	Number of separators
Blackspring silt loam	21	1·00	0·67	1·00	0·43	0·19
Vulcan fine sandy loam	17	1·00	0·35	0·76	0·35	0·06
Vulcan silt loam	75	0·89	0·48	0·81	0·35	0·28
Vulcan loam	52	0·88	0·42	0·96	0·44	0·25
Vulcan clay loam	28	0·71	0·39	0·68	0·29	0·25
Carmangay fine sand	39	0·54	0·23	0·49	0·18	0·18
All farms	232	0·82	0·42	0·79	0·34	0·23

TABLE 42.—AVERAGE NUMBERS OF SPECIFIED TYPES OF MACHINERY PER FARM IN THE LOMOND DISTRICT OF ALBERTA, 1935

Soil type	Number of farms	Number of autos	Number of trucks	Number of tractors	Number of combines	Number of separators
Sundial silt clay loam	13	1·00	0·31	0·54	0·31	0·08
Armada clay loam	46	0·70	0·24	0·59	0·26	0·20
Lomond-east clay loam	62	0·58	0·19	0·47	0·15	0·15
Lomond loam	97	0·58	0·20	0·48	0·22	0·16
Lomond fine sandy loam	26	0·46	0·23	0·38	0·23	0·04
Lomond fine sand	17	0·65	0·29	0·29	0·24	0·06
All farms	261	0·61	0·22	0·48	0·21	0·14

Tables 41 and 42 give the average number per farm of automobiles, tractors, trucks, combines and separators, according to the various soil belts. In the Vulcan district there were only about 3 cars for every 5 families. Approximately the same ratio held true of the other power equipment.

Within the individual soil belts, an average of one car per farm was found on those soils which showed substantial returns during the crop year 1934-35. In the Vulcan district both the Blackspring silt loam and the fine sandy loam farmers averaged a car to the family while the same was true of only the Sundial silt-clay loam in Lomond. On the Carmangay fine sand there was only one car for every two families, with the remainder of the soil belts ranging between these extremes. In the Lomond district farmers on the fine sandy loam owned less than one car for every two families, while the remainder, except for the high producing silt clay, had a little more than one car for each two families. Numbers of the other types of large machine were in approximately the same relationship.

Labour

As with machinery, so also with labour; the operators of the more extensive Lomond farms used much less hired help than did those of Vulcan (See Table 43).

TABLE 43.—AVERAGE LABOUR MONTHS WORKED IN THE VULCAN-LOMOND AREA OF ALBERTA, 1935

District	Number of farms	Paid labour					Unpaid labour total			Total labour months
		Year help	Month help	Day help	Maids hired	Total paid	Family	Operator	Unpaid	
Vulcan.....	232	0·94	2·45	1·31	0·83	5·53	4·87	11·76	16·63	22·16
Lomond.....	261	0·23	1·19	0·82	0·57	2·81	4·90	11·68	16·58	19·39

The difference in labour used was almost wholly accounted for in the amount of paid labour. Unpaid family help and months spent by the operator on the farm were almost identical in the two districts, but farmers in the Vulcan district employed double the hired labour force used in Lomond. The wide difference was partially due to the temporary inability of the Lomond operators to guarantee wages to hired help. Some account must also be taken of the slightly smaller cropland acreages on the Lomond farms and also the lesser costs of harvesting due to the very low yields in 1934.

The same general trends were noticeable between the various soil belts as between the two major districts. The Blackspring silt loam farmers used much the larger total number of months of labour, both hired and farm family labour. The least productive fine sand was in the lowest group for paid labour along with the fine sandy loam. This fine sandy loam required much less power and tillage than the other soils, although its productivity seemed to be relatively high. The lowness of the labour bill was therefore not explainable in terms of its low productivity but rather in terms of ease of cultivation.

Three factors therefore seem to show up in the relationships between the amount of labour used on the farm: supply of family labour; ease of cultivation and, therefore, capacity for power use due to differences in soil texture; and finally, ability to hire men in the wage competition through guarantee of

payment. Wage rates did not seem to vary greatly for the same type of work. This seems a natural result since farm hands are usually a mobile part of the population and find their way to where highest rates are paid.

Management and Land Tenure

To some people the real problem of the drought area is one of management. No doubt many farmers made errors in the combinations of the factors of production, farmed too intensively or too extensively for prevailing conditions; specialized in wheat growing where some subsidiary forms of enterprise might have been more profitable; or used large-scale machinery when less expensive equipment would have served the purpose better, but such errors occur in all agricultural communities. From the point of view of farm management and land utilization research the point is not that individual farmers are poor or good managers but rather certain men and certain methods of farming are adapted to certain areas. The general ability of individual farmers can not easily be changed but the success of certain methods of tenure, land use and combination of the factors of production can be pointed out in order that all farmers may be in a better position to judge the relative merits of each.

Much of the original land settlement in the Canadian Prairie Provinces was by homesteading and pre-emption which resulted in eventual ownership but many of those who acquired land ownership in this way gave up farming or moved to other districts. Those who remained bought outright or rented from the first owners. Those farmers who wished to increase their holdings, usually did so by purchase, but more recently with the rapid expansion in the size of farms made necessary to adjust operations to the more highly mechanized method of farming, many land additions have been made by renting. Farmers who were without capital had, of course, no alternative and were forced to rent. Tenancy, therefore, is the normal outcome of the original method of settlement.

Among the farmers interviewed in the Lomond district in 1935, 17 out of every 100 rented their farms, while in the Vulcan district, the figure was 35. The percentage owning their farms entirely in Lomond was 39 as against 43 in Vulcan, and the figures for part-owners were 44 and 22 respectively.

It would seem that in the drier district of Lomond where land is not so expensive, a larger proportion of farmers owned at least a part of the land they worked. But the lower purchase price in this district created a certain amount of speculative buying in anticipation of increased land values.

Racial origin plays a part in land tenure and the original European migrants to the Canadian west had for their goal the eventual ownership of their farms. The slightly larger proportion of these original settlers or their descendants in the Lomond district, may in part be responsible for the greater number of farm owners in that district.

The tenure of land holdings is a factor of real concern to those who are interested in the conservation of land resources. It is generally true that a high proportion of ownership is indicative of comparative newness of settlement and also of the farmers' interest in the continued productivity of the soil. Where wind erosion and the weed menace are acute problems, the owner-operator usually maintains his land in a higher state of productivity over the years than the tenant. The tenants generally tend to move about much more frequently than the owners. This was indicated in the study by the average years part owners and tenants had remained on the same farm. In the Vulcan district, the owners had been on their farms an average of 20·5 years, the part owners 18·3 years and the tenant only 5·6 years. In the Lomond district, the figures were 19·5 years, 17·6 years and 5·1 years respectively. Some difference in the number of years on the same farm was, of course, due to difference in age of

the three groups. Owners in the Vulcan district average 52·9 years, part owners 49·6 years and tenants only 43·8 years of age. Ages in Lomond were 53·8, 49·5 and 41·1 years respectively for the same groups.

In the least productive and most fluctuating fine sand soil belts, the tenants moved even more rapidly than from the better silt loam soil belts where soil drifting and weeds were not such acute problems. Since the tenants remained only for short periods on the farms, their efforts were confined to obtaining from their holdings the maximum "short run" returns. Such a procedure was not conducive to the most efficient "long run" methods of soil conservation. Improper and inefficient summer-fallow methods may have been practised by the tenants which resulted in great deterioration of the soil through excessive soil drifting and the growth of weeds.

In general, it must be noted, however, that during periods of low prices, tenant-operators are in a more favourable position than owner-operators. Share rents fluctuate with the changes in the price of the crops and live stock produced and farm rents are reduced during times of low prices. This is not so true of the costs of land for owner-operators and landlords. Interest rates vary little during bad times and land debts actually increase in terms of farm prices. As a consequence, tenants pay less for the use of the land during depression periods, while owners still have capital charges to meet based on a pre-depression valuation. It was this factor more than any other, that accounted for the higher earnings among tenants than among owners during the year of the study.

While it is true that tenants were more inclined to "use up" the land than were the owners, and also true that the tenants were able to make more substantial returns during periods of depression, it was also true that certain factors offset these tendencies. The landlords whose chief interest is in "long run" returns from their land, charged higher rents to those tenants who did not maintain the productivity of the soil or alternately required tenants, by contract, to summer-fallow and follow such practices as would keep the farm in satisfactory condition. Further, the advantage which seemed to be with the tenants during the depression period was often more than offset during the periods of high prices for farm products. Landlords are able to charge relatively high cash rents at such times and owner-operators gain also, for their capital charges become less burdensome as the price of farm products increase and come into line with their actual long term financial obligations, or provide a sufficient farm income to justify the original investment in the farm.

TABLE 44.—FREQUENCY DISTRIBUTION OF SEVERAL RENTAL CONTRACTS ACCORDING TO SOIL TYPE IN THE VULCAN DISTRICT OF ALBERTA, 1935

Soil type	Contracts	Share of crop					Cash and other	
		One-half	One-third	One-quarter	One-fifth	One-sixth	Cash	Other
	No.	No.	No.	No.	No.	No.	No.	No.
Blackspring silt loam	12	4	5	2	1	.....	.....	.....
Vulcan fine sandy loam	11	3	4	4	.....	.....	.....	.....
Vulcan silt loam	47	12	32	1	1	.....	.....	1
Vulcan loam	32	12	18	1	.....	.....	.....	1
Vulcan clay loam	18	4	12	2	.....	.....	.....	.....
Carmangay fine sand	30	10	8	11	.....	.....	.....	1
Total	150	45	79	21	2	.....	.....	3
Per cent of total	100	30	53	14	1	.....	.....	2

TABLE 45.—FREQUENCY DISTRIBUTION OF SEVERAL RENTAL CONTRACTS ACCORDING TO SOIL TYPE IN THE LOMOND DISTRICT OF ALBERTA, 1935

Soil type	Contracts	Share of crop					Cash and other	
		One-half	One-third	One-quarter	One-fifth	One-sixth	Cash	Other
	No.	No.	No.	No.	No.	No.	No.	No.
Sundial silt clay loam	3	1	.....	2	.....	.....	.....	.....
Armada clay loam	37	8	6	20	2	.....	1	.....
Lomond-east clay loam	49	3	6	26	9	1	.....	4
Lomond loam	82	16	7	28	26	2	.....	3
Lomond fine sandy loam	19	5	.....	8	5	1	.....	.....
Lomond fine sand	11	.....	.....	6	3	.....	.....	2
Total	201	33	19	90	45	4	1	9
Per cent of total	100	16	10	45	22	2	.....	5

Among the farms included in the study, share-renting was almost universal and only one farm was being operated on a cash rent basis. In the Vulcan district where land values were higher, 53 per cent of all share rental agreements were on a basis of "one-third share of crop clear in the elevator," and 14 per cent on a "one-quarter share of crop clear in the elevator." (Table 44.) On the other hand, in the less highly priced land in the Lomond district, the reverse was the case and only 10 per cent of all agreements called for one-third of the crop and 45 per cent were at the lower rate of a one-quarter share. (Table 45.) Thus in the area of low priced land with its less productive soil, the smaller gross returns were offset by a lower rent for the land. The preponderance of share-renting contracts over cash rents was an acknowledgment of the hazardous nature of profitable farming in this area.

REVENUE AND EXPENDITURE

Sources of Cash Revenue

The major source of cash revenue in the two districts studied was from crop sales, chiefly wheat. A few farmers received substantial returns from the live stock enterprise, but on the average the amounts were not significant except during such years as 1935, when yields of grain were extremely low and prices also much lower than usual. Except for relief only a few farmers had substantial receipts outside of the farm business.

Table 46 presents the average and percentage distribution of sources of cash revenue. In the Vulcan district, 67 per cent of all sources of cash revenue were from the sale of wheat and 1 per cent from the sale of other grains. In Lomond the proportion was not so high, 44 per cent being from wheat sales and 1 per cent from other grain sales.

This was for the crop year 1934-35, when the average total cash receipts of $2,650 per farm in Vulcan and $1,389 per farm in Lomond were much below normal. The other major source of cash revenue was through net reductions of inventory[1] and capital assets through selling breeding stock, machinery, land, old wheat on hand, or through increasing the net debt position and decreasing the cash on hand and money in the bank. These items accounted for an average of $414 in the Vulcan district and $369 in Lomond, or 16 per cent and 27 per cent respectively, of the total cash revenue. The difference is explained partially by the fact that the Lomond operators had smaller reserves of cash or credit upon which to draw and partially also because they had not been accustomed

[1] See appendix B for definition.

to the continued high standard of living enjoyed by the majority of the Vulcan farm families until the beginning of the depression. As a consequence the Lomond farmers were more willing to get along on meagre fare rather than make such great absolute inroads into their working capital.

TABLE 46.—SOURCES OF CASH REVENUE PER FARM IN THE VULCAN AND LOMOND DISTRICTS OF ALBERTA, 1934–1935

Source of cash revenue	Vulcan district 232 farms		Lomond district 261 farms	
	Amount per farm	Percentage	Amount per farm	Percentage
	$	%	$	%
Cash farm receipts—				
Crop sales	1,790	67	625	45
Livestock sales	181	7	88	6
Farm produce sales	53	2	43	3
Other	107	4	103	8
Total cash farm receipts	2,131	80	859	62
Cash non-farm receipts	105	4	161	11
Reduction of inventory	414	16	369	27
Total cash revenue	2,650	100	1,389	100

See Appendix C, Tables 2 and 3, for further details.

Sources of cash receipts from outside the farm accounted for only 4 per cent of the total cash revenue in Vulcan and 11 per cent in Lomond. This difference in the two districts was another indication of the unstable and unproductive nature of the farming enterprises on the eastern side of Lake McGregor. Here the farmers were forced to go outside the farm in order to supplement the farm income. The chief items were for road work and outside labour in both districts with only a very small proportion coming from interest, dividends and the like from savings invested outside the farm business.

TABLE 47.—AVERAGE AND PERCENTAGE DISTRIBUTION OF CASH REVENUE AND CASH EXPENDITURE, VULCAN AND LOMOND DISTRICTS OF ALBERTA 1934-35

—	232 farms in Vuncan district		261 farms in Lomond district	
	$	Percent of total	$	Percent of total
Cash farm expenses	1,274	48	626	45
Farm interest	338	13	135	10
Capital and investment	330	12	102	7
Cash living expenses	708	27	526	38
Total cash expenses	2,650	100	1,389	100
Total cash revenue	2,650	100	1,389	100

Cash Expenditure

Gross revenue and expenditure figures are one indication of the size of business, and between businesses of relatively similar organization are indicative of the productivity and efficiency of the enterprise. It will be noted from Table 47

that the gross cash revenue from all sources in Vulcan was $2,650 as compared with only $1,389 in Lomond.

Attention has already been drawn to the item of reduction of inventory. It was shown that the year 1934-35 left many farmers without normal cash sources of revenue and forced them to reduce their reserves, in order to continue farming operations and provide a living for the farm family. Contrasted with the item of reduction of inventory is that on the expenditure side termed capital and investment.[1] This included such items as increase in bank balance, holding of part or all of the year's grain production, paying off debts, buying machinery or breeding stock, etc. The item offsets that of reduction of inventory partially. In Vulcan district the capital and investment figure was $330 as compared with only $102 in Lomond. In Vulcan 60 per cent and in Lomond 79 per cent were forced to reduce their net cash or capital inventory by some means or other in order to carry on the farm business and to maintain the household.

The amount of the investment or of the reduction of inventory is an indication of the extent to which the farmer provides for his annual depreciation and savings. The amount of depreciation for the Vulcan area was calculated as $224 per farm and the net change in cash inventory was $-84. This suggests a considerable reduction in the farm capital and savings of the operators amounting to $328 per farm on the average in Vulcan, the parallel net figure for Lomond was $420. Naturally this does not take into consideration the change in value of assets due to changes in the general price level. At the time of the study it was a question how long farmers could continue to use up their savings in order to carry on their farming operations and maintain an adequate standard of living.

Fig. 14.—An old-country gardener makes a gravel hill produce. Loam, Alberta, 1935.

Table 47 also presents the average dollars spent on farm expenses, farm interest and living. As might be expected, the largest item of expenditure was that for cash farm expenses. These are listed in detail in Appendix C, Tables 4 and 5. The absolute amount in Vulcan was almost double that of Lomond. Farm interest was more than twice as much in Vulcan, cash investment was over three times as large, but cash living expenses were only one and one-third times as great. Of the gross revenue of Lomond farms 38 per cent was spent on living, while only 27 per cent was so used in Vulcan. In more normal years the proportion spent on living would be less, although the absolute amount would be higher.

[1] See appendix B.

Net Returns to Farm Operators

The previous section has shown the main sources of cash revenue and the chief classes of cash expenditure. This section will deal more specifically with the net returns from the farm business in terms of actual revenue and expenditure.[1]

Of the 232 farms in Vulcan, 158 or 68 per cent showed positive operators' income, while in Lomond 153 or 59 per cent of the 261 farms were in the positive group. This operators' income figure is that surplus which remained to pay the operator for his own wages and for profits which might normally be expected to accrue to him. When the operators' estimates of their own wages are deducted from the figures above, the remaining figure is profit. Among the Vulcan operators 37 per cent showed profit over and above their estimated annual wages, while in Lomond the proportion was only 18 per cent. In both districts the majority of these men were on the silt loams, although a large number of them were also from the Vulcan fine sandy loam in the western district.

These figures give some indication of the relative net returns which farmers received in these two district during the crop year 1934-35. The question naturally arises as to what difference might be expected if the year had been normal or average. No doubt a normal crop in each of these districts would have provided profits approaching equality except to the extent that the Lomond farmers had been unable to maintain their farms in as efficient condition as the Vulcan farmers. Gross returns would have not been as large in the Lomond district but the lesser costs of production, chiefly in land cost would have left the profit very nearly the same in each district. Otherwise, more abandonment can be expected in the Lomond district.

Size of Farm and Net Returns.—Table 48 serves to explain one of the reasons why the smaller farms continued in operation. During the years of poor yields and low prices, the small farms showed better returns than the larger ones. The costs of operating small farms were more largely of the variable nature and can be changed from year to year more readily than can those on the larger holdings where the investment in large scale machinery and equipment is great. In Table 48 it will be noticed that the relative numbers with positive operator's incomes were larger on those farms of one section or less than on the larger holdings.

TABLE 48.—AVERAGE DISTRIBUTION OF OPERATOR'S INCOME ACCORDING TO SIZE OF FARM IN THE VULCAN-LOMOND DISTRICT OF ALBERTA CROP YEAR, 1934-35

Size of farm (quarters)	Vulcan district						Lomond district					
	Number of farms	Operator's income				Income net	Number of farms	Operator's income				Income net
		Positive		Negative				Positive		Negative		
		No.	$	No.	$	$		No.	$	No.	$	$
1	10	10	245	.....	.....	245	8	5	216	3	−170	71
2	49	37	417	12	−240	256	46	34	207	12	−312	72
3 and 4	82	54	770	28	−418	367	103	66	443	37	−310	173
5 and 6	49	32	977	17	−970	301	54	29	445	25	−498	9
7 and 8	21	13	954	8	−1,001	209	29	11	647	18	−341	34
9 and over	21	12	1,192	9	−1,376	91	21	8	508	13	−762	−279
All farms	232	158	745	74	−695	287	261	153	402	108	−409	66

This applied to both areas but was more noticeable in the Lomond district where the yields were low. In the better years it can be assumed that the trend would be in the opposite direction with the larger holdings showing much higher net returns since their costs would increase but slightly, while the returns increase very quickly with higher yields and higher prices.

[1] See Appendix B for methods of calculation and definition of terms and Appendix C Table 6.

Soil and Net Returns.—The productivity of soil is a determining factor in net returns to farm operators in any one year. The wide variations between net farm returns are shown in Tables 49 and 50 and Figure 15. The soil classes were arranged in their order of approximate long time average yields of wheat.

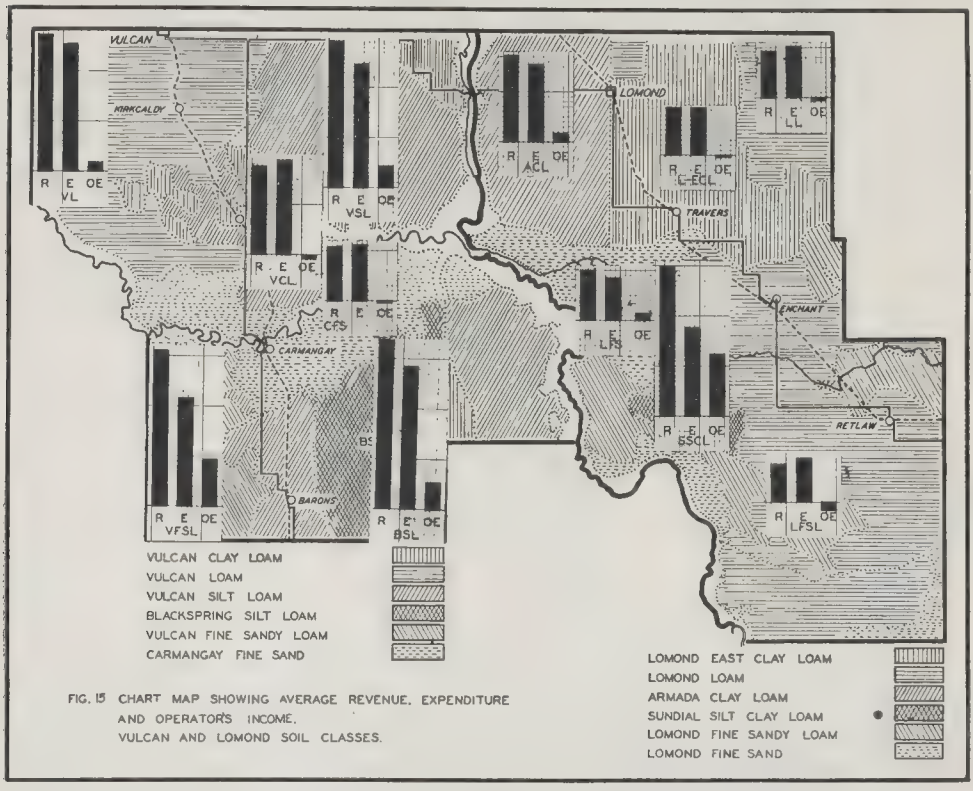

FIG. 15 CHART MAP SHOWING AVERAGE REVENUE, EXPENDITURE AND OPERATOR'S INCOME. VULCAN AND LOMOND SOIL CLASSES.

NOTE.—R—revenue, E—expenditure, OE—operator's income.

During the dry years such as that of 1934 for which the figures are given, the variations between operator's income on different soil classes were very great since the costs of operation did not vary in proportion to the decreases in yields when precipitation was low. When precipitation is relatively high, it is generally true that the net returns from the different soil classes is approximately the same.

TABLE 49.—DISTRIBUTION OF OPERATOR'S INCOME ACCORDING TO SOIL TYPE IN THE VULCAN DISTRICT OF ALBERTA, CROP YEAR 1934-1935

Soil type	All farms		Farms with positive operator's income		Farms with negative operator's income	
	Number of farms	Net operator's income	Number of farms	Amount	Number of farms	Amount
	No.	$	No.	$	No.	$
Blackspring silt loam	21	524	13	1,116	8	— 441
Fine sandy loam	17	928	15	1,114	2	— 320
Silt loam	75	432	54	903	21	— 779
Vulcan Loam	52	196	38	650	14	— 1,033
Clay loam	28	— 88	17	419	11	— 873
Carmangay fine sand	39	— 26	21	278	18	— 381
All Vulcan	232	285	158	745	74	— 695

This may be explained by the fact that the heavier, and, on the average, more productive soils will withstand drought better than will the lighter ones; but with relatively high precipitation the yields are very similar. What difference does occur in yields is made up by the lower costs per acre on the lighter and less intensively worked soils. In the first stages of settlement it seems to be true that farmers generally based their farming practices and use of the land more upon the better years than on the average. This fact accounts for much of the difficulty which has occured in the past. Until it is recognized that the fine sand soils cannot be worked as intensively as the silt loam, continued trouble will be experienced whenever dry years occur.

TABLE 50.—DISTRIBUTION OF OPERATOR'S INCOME ACCORDING TO SOIL TYPE IN THE LOMOND DISTRICT OF ALBERTA, CROP YEAR 1934-1935

Soil type	All farms		Farms with positive operator's income		Farms with negative operator's income	
	Number of farms	Net operator's income	Number of farms	Amount	Number of farms	Amount
	No.	$	No.	$	No.	$
Sundial silt-clay loam	13	1,231	11	1,549	2	— 520
Armada clay loam	46	178	32	445	14	— 432
Lomond-east clay loam	62	— 3	37	229	25	— 349
Lomond loam	97	— 55	47	343	50	— 431
Lomond fine sandy loam	26	— 144	15	121	11	— 504
Lomond fine sand	17	139	11	345	6	— 222
All Lomond	261	66	153	402	108	— 409

In Table 50 it is shown that the operators on fine sand ranked third in relative position with respect to operator's incomes in Lomond. The farmers interviewed on this soil class included among their number some who had recognized early the low average productivity of the sandy soil and had organized their farming operations accordingly. The close proximity to vacant land gave them the opportunity to acquire large holdings of cheap leaseland which in turn encouraged them to operate their wheat enterprise in combination with sheep ranching, since these farmers are not adjacent to exceptionally productive soil belts, such as is true of the farmers of the fine sand in Vulcan, they have not attempted to farm their wheat land as intensively as is done on the heavier soils. They picked out the small patches of useable soil near their farmsteads and allowed the remainder, chiefly eroded land, to lie idle as a source of occasional pastureland. This was one of the signs of adjustment to a system of land use which would provide more stable net returns than would be possible with specialized wheat production on a less extensive scale.

Tenure and Net Returns.—In farming communities the relative profitableness of owning or renting land is continually being questioned. In the long run, the assumption is that the cost of land to owners and to tenants will be equal except to the extent that the normal farmer is one who is willing to pay more for the use of the land if he can have complete title to it. In this case, one would expect the cost of land to be greater to that operator who purchased rather than to the one who rented. In the material presented below it will be shown that during the year 1934-35 when prices and yields were low in the Vulcan-Lomond area, the tenants made a much better showing in net returns than did the owners or even part-owners. This was true even when the value of owned land was estimated on the basis of present and future possibilities rather than on past acquisition prices, except to the extent that interest payable on mortgages and agreements of sale was included in the annual cost.

TABLE 51.—DISTRIBUTION OF OPERATOR'S INCOMES ACCORDING TO TENURE IN THE VULCAN DISTRICT OF ALBERTA, CROP YEAR 1934-1935

Tenure	All farms		Farms with positive operator's income		Farms with negative operator's income	
	Number of farms	Net operator's income	Number of farms	Amount	Number of farms	Amount
	No.	$	No.	$	No.	$
Owners	100	114	59	668	41	— 684
Part-owners	82	402	53	1,054	29	— 790
Tenants	50	438	46	486	4	— 125
All farms	232	287	158	745	74	— 695

TABLE 52.—DISTRIBUTION OF OPERATOR'S INCOMES ACCORDING TO TENURE IN THE LOMOND DISTRICT OF ALBERTA, CROP YEAR 1934-1935

Tenure	All farms		Farms with positive operator's income		Farms with negative operator's income	
	Number of farms	Net operator's income	Number of farms	Amount	Number of farms	Amount
	No.	$	No.	$	No.	$
Owners	102	59	54	467	48	— 400
Part-owners	114	— 10	58	396	56	— 431
Tenants	45	275	41	324	4	— 223
All farms	261	66	153	402	108	— 409

Tables 51 and 52 present the relative positions of the various tenures with respect to operator's income for the year 1934-35. A much larger proportion of the tenants had positive operator's incomes than had the owners and part-owners of each district. Of interest also is the fact that the net absolute amounts were higher for the tenants than for the other two classes.

The preceding sections of this report have largely dealt with an analysis of conditions which existed in the areas studied in 1934-35. It is, however, essential particularly from the point of view of land utilization to consider what has been taking place over a longer term of years.

INDEBTEDNESS OF FARM OPERATORS

Distribution of Farm Debts

This section presents the indebtedness of operators as a background for later analysis of factors in financial progress. Credit and debt fluctuations have contributed a large share to the poverty of many dry area operators. The many foreclosures and quit claims tell a vivid story of defeat and abandonment, especially in the light soil areas.

The acquisition of land and the purchase of machinery were the chief sources of indebtedness, but during the depression period from 1929 to 1935, taxes, interest and the like increased the burden of debt materially. The depression period intensified the debt situation, not only through causing inability to pay annual obligations but also through the shift upwards in liabilities in relation to assets due to lower prices for products of the farm.

The very high prices paid for land and buildings and the more extensive credit granted by farm machinery companies and banks in the more productive Vulcan district, caused eventual indebtedness to be much higher there than in Lomond. The depression affected this aspect of the farm problem more seriously in the former district than in the latter, for credit agencies began to withdraw from the drier Lomond area years ago and for that reason a much smaller debt burden accumulated on the east side of Lake McGregor than on the west. More extensive agriculture and therefore cheaper land and lesser use of machinery tended to limit Lomond debts.

Tax and relief indebtedness, which was not large in relation to land and machinery, were involuntary credit items and were found on a larger number of farms in the Lomond than the Vulcan area. This accounted for the slightly larger proportion of operators entirely free of all debt in the Vulcan than in the Lomond district. Nine per cent of the Vulcan operators were free of all liabilities as compared with only 5 per cent in Lomond.

Table 53 presents in average and percentage per farm the distribution of indebtedness in the two districts.

TABLE 53.—AVERAGE AND PERCENTAGE DISTRIBUTION OF INDEBTEDNESS FOR THE VULCAN-LOMOND DISTRICT OF ALBERTA

Class of debt	232 farms in Vulcan district		261 farms in Lomond district	
	$	Percent of total	$	Percent of total
Land	4,148	74	1,311	51
Machinery	397	7	348	13
Tax	344	6	208	8
Relief	31	1	150	6
Bank	144	3	208	8
Other	432	7	229	9
Total farm debt	5,496	98	2,454	95
Total family debt	130	2	128	5
Total liabilities	5,626	100	2,582	100

For the Vulcan farm operators the average total debt was $5,626 as compared with an average of $2,582 for the Lomond farm operators. The greater average indebtedness for the Vulcan farmers may be explained by the fact that the soil of this district as a whole was more productive over the years than that of the Lomond district. The capacity for higher yields over the years is coincident with a higher debt carrying capacity.

No satisfactory indication of the freedom with which credit was granted in the past in relation to the productivity of the soil was available, as some debts had been paid off previously and no definite record kept. The only index of this was the total debt at the time the study was made and such figures, of course, refer to the more recent years. The Vulcan owners carried a debt of $14.10 per acre of cropland as compared with $6.20 per acre of cropland for the Lomond district. However, the former had assets to the extent of $24.70 per acre, and the latter $16.10 per acre. The net equity of the two districts was relatively the same, being $10.60 per acre of cropland for Vulcan and $9.90 for the Lomond district. Since the majority of debts were undertaken at a time when assets were of much more value than at the time of the study these two figures have meaning only in terms of conditions at that time and change rapidly with the changing cycle of prices and yields.

Of the total number of Vulcan owners or part-owners 77 per cent had land debts averaging $1,311 for all farms. The land debt accounted for 74 per cent of all debts in Vulcan and 51 per cent of all debts in Lomond. These figures

tend to bear out the contention that land values and land credit had been working towards an adjustment to average productivity and intensity of farm operation.

The less productive lands carried smaller debts on the whole than the more productive in spite of the greater ability of the latter to make principal payments. This is a further indication of the long run adjustment by which land cost tends to even out net returns from one district to another.

It should be borne in mind that it is difficult to see to what extent the present debt was the result of acquiring land or credit at a time when agricultural prices and production were high, or on the other hand to estimate to what extent the lack of debt on certain farms was due to the acquisition of holdings at a time when prices were very low and operator's savings high. It must be remembered too, that chance crops in some districts were sufficient in certain years to pay off very large amounts of the accumulated indebtedness.

The observations regarding land debts apply in some measure to the debts against other items of security. The less intensive use of machinery in the Lomond district resulted in a slightly lower machinery indebtedness as shown in Table 53. As was pointed out previously, however, there was a tendency for the two districts to make large purchases of machinery in the very prosperous years and to make them on a relatively similar level. The later inability of the Lomond farmers to pay off the indebtedness thus assumed accounts in large measure for the smallness of the difference between the average debt of the two districts.

Bank debts were actually higher in Lomond averaging $208 compared with $144 in the Vulcan district. In the Lomond district many of the bank debts were contracted many years ago, and very small payments have been made on them since they were assumed. Other farm debts were somewhat higher in Vulcan but not in proportion to the difference in land debt.

Indebtedness accumulated through non-payment of taxes and through relief grants were on a different basis than those against farm capital since they were not voluntary credit but rather forced credit by the municipality or government. Table 53 shows the tax debt in Vulcan to be somewhat higher than that of Lomond. However, this is more or less misleading since tax levies were much higher in the Vulcan district. Actually 88 per cent of the owners or part-owners in the Lomond district were delinquent in the payment of taxes as compared with 72 per cent in Vulcan. The more highly developed community services of the Vulcan district accounted for the higher taxes and large temporary average tax debt. During the year of the study a very large proportion of the Vulcan farmers paid their current taxes and a part of the arrears through the consolidation system. In Lomond the number who paid their 1934 taxes was very small.

The relief debt was an insignificant part of the Vulcan liabilities except on the Carmangay fine sand. Only 28 per cent of the Vulcan operators received feed and seed from the government for which in 1935 they still owed some part of the advance. In the Lomond district 74 per cent of the operators had outstanding relief feed and seed or direct relief obligations. A very small proportion of the remaining 25 per cent received some governmental assistance and repaid the amount. Most of this latter group never obtained any help in the form of direct relief. Of that group in Lomond who still owed relief debts in 1935, the average amount per farm was $202 as compared with only $109 in Vulcan. For all farms in the sample the average figures were $150 and $31 respectively.

Family debts included outstanding obligations for groceries, health and life insurance premiums. These were of sporadic and usually short run duration, and for that reason tended to be approximately the same in all districts. The average amount of this type of indebtedness was in Vulcan $130 and in Lomond $128.

Size of Farm and Indebtedness.—Certain relationships between the size of the farm and the total amount of indebtedness and its distribution are discernible. With the larger farm units it might be expected that the total liabilities would be greater than for the smaller ones. Tables 54 and 55 show this to be true of both districts. With the exception of the quarter-section size in Vulcan and Lomond, the parallel size units had much higher total indebtedness in Vulcan. The explanation of the smaller total debt on the quarter-section farm in Vulcan is that farmers on 160 acres never accumulated more land than their original homestead and had acquired very little debt on this holding, since it had no original purchase price. On the other hand, in Lomond, the quarter-section farmer was generally one who had previously operated a much larger unit but had lost all but that parcel on which his buildings were located. Against this he often owed a large part of the original agreement of sale. In general, however, one would expect that as the farm increased in size and the capital equipment necessary to run the farm increased, liabilities would also increase. This certainly was the case among the farms studied. In Vulcan the debts averaged from $821 on the smallest units to $11,435 on the largest, while in Lomond the figures were $1,464 and $5,966.

TABLE 54.—AVERAGE DISTRIBUTION OF INDEBTEDNESS ACCORDING TO SIZE OF FARM (OCCUPIED QUARTERS) IN THE VULCAN DISTRICT OF ALBERTA, 1935

Occupied quarters	Number of farms	Land	Machinery	Tax	Relief	Bank	Other farm	Total farm	Total family	Total liabilities
		$	$	$	$	$	$	$	$	$
1	10	316	.....	134	33	110	109	702	119	821
2	49	2,791	112	206	40	27	365	3,541	107	3,648
3 and 4	82	3,710	267	257	34	213	543	5,024	120	5,152
5 and 6	49	4,942	859	356	32	188	294	6,671	152	6,823
7 and 8	21	4,125	479	427	11	188	367	5,597	179	5,776
9 and over	21	9,015	594	992	10	22	705	11,338	97	11,435
All farms	232	4,148	397	344	31	144	432	3,496	130	5,626

TABLE 55.—AVERAGE DISTRIBUTION OF INDEBTEDNESS ACCORDING TO SIZE OF FARM (OCCUPIED QUARTERS) IN THE LOMOND DISTRICT OF ALBERTA, 1935

Occupied quarters	Number of farms	Land	Machinery	Tax	Relief	Bank	Other farm	Total farm	Total family	Total liabilities
		$	$	$	$	$	$	$	$	$
1	8	882	.....	183	217	62	52	1,396	68	1,404
2	46	759	152	114	150	241	179	1,595	144	1,739
3 and 4	105	1,200	247	175	142	194	180	2,138	112	2,250
5 and 6	54	1,004	385	194	145	286	107	2,121	136	2,257
7 and 8	29	1,521	736	319	217	138	504	3,435	139	3,574
9 and over	21	3,726	780	469	89	165	575	5,802	104	5,966
All farms	261	1,311	348	208	150	208	229	2,454	128	2,582

While it is true that total liabilities increased with the size of the farm, not all individual items increased in the same relationship. The large operators had relatively heavier burdens of debt in the land, machinery, tax and other farm debt[1] items, but smaller amounts owing on relief feed and seed. The average bank debt varied only slightly from the small to the large farm in both areas although in times past the larger operators were given larger loans from the banks. Conversely they had apparently been better able to pay off the loans. The sporadic nature of the family debt items is shown in the table. The middle groups of farm units according to size had the largest items in Vulcan, while the larger farms had slightly higher amounts in the Lomond district.

[1] Includes live stock, lumber, blacksmith, hardware, chattel mortgages, garage bills, hired farm work and back wages to hired help.

Soil and Indebtedness.—The amount and distribution of indebtedness varied greatly between the individual soil belts in each of the districts. The chief difference between districts was in land debt. The more productive soils naturally had larger debt-carrying capacity and as a consequence of this alone one might expect that the operators on the better soils would carry higher debts. However, at this stage in the settlement of the communities, the long run productivity of the various soils had not yet been definitely determined. Many parcels of land on the poorer soils had mortgages or agreements of sale against them which were originally equivalent to those which were placed against more productive parcels. Also the more productive soils provided greater surpluses to pay off substantial amounts of the original debt, whereas the crop failures on the poor soils tended to increase the debt against them through accrued interest and non-payment of principal due.

Tables 56 and 57 present the distribution of the major debts of farm operators according to soil. The heaviest total debt was found in the moderately productive Vulcan loam. This soil belt was for the most part almost equally productive with the Blackspring silt loam, which had the lowest total debt. As a consequence credit was extended in the better years equally to these two soils belts. However, during the years immediately preceding the study the Vulcan loam was seriously affected by hail and suffered more acutely with drought. The debt burden actually increased in contrast to the decrease which occurred in the Blackspring soil belt where continuous yields of average crops provided surpluses with which the interest and principal were paid. The Carmangay fine sand with its fluctuating productivity had the least total debt. Peculiarly enough, the lowness of debt in this belt was due to early knowledge of its low yields, and consequent foreclosures and quit claims, as well as lack of credit, accounted for its relative position. It is in direct contrast with the Blackspring silt loam in which the lowness of debt was due to ability to pay the accumulated liabilities, rather than the lack of credit or bankruptcy.

TABLE 56.—AVERAGE DISTRIBUTION OF INDEBTEDNESS ACCORDING TO SOIL TYPE IN THE VULCAN DISTRICT OF ALBERTA, 1935

Soil	Number of farms	Land	Machinery	Tax	Relief	Bank	Other farm	Total farm	Total family	Total liabilities
		$	$	$	$	$	$	$	$	$
Blackspring silt loam	21	2,109	327	167	1	157	289	3,050	159	3,209
Vulcan fine sandy loam	17	4,735	501	375	16	218	459	6,304	137	6,441
Vulcan silt loam	75	3,980	397	381	28	118	473	5,377	106	5,483
Vulcan loam	52	6,821	527	513	24	219	408	8,512	144	8,656
Vulcan clay loam	28	2,696	282	208	33	75	432	3,726	164	3,890
Carmangay fine sand	39	2,790	299	226	65	107	451	3,938	114	4,052
All farms	232	4,148	397	344	31	144	432	5,496	130	5,626

TABLE 57.—AVERAGE DISTRIBUTION OF INDEBTEDNESS ACCORDING TO SOIL TYPE IN THE LOMOND DISTRICT OF ALBERTA, 1935

Soil	Number of farms	Land	Machinery	Tax	Relief	Bank	Other farm	Total farm	Total family	Total liabilities
		$	$	$	$	$	$	$	$	$
Sundial silt loam	13	646	557	65	43	917*	127	2,355	98	2,453
Armada clay loam	46	2,133	305	260	167	322	366	3,523	160	3,683
Lomond-east clay loam	62	1,260	305	236	106	71	165	2,143	97	2,240
Lomond loam	97	1,149	349	212	181	226	271	2,388	149	2,537
Lomond fine sandy loam	26	1,244	411	164	195	44	87	2,145	110	2,255
Lomond fine sand	17	804	363	118	108	6	229	1,628	91	1,719
All farms	261	1,311	348	208	150	208	229	2,454	128	2,582

* One operator owing the bank a large amount accounts for the high average.

The variations in land debt between the soil belts was carried also into the other items of indebtedness. The two opposing forces, ability to obtain credit and ability to repay it so acted as to obscure the picture. The more productive soil belts generally received more credit for machinery, bank loams and the like, but it was equally true that they were in a better position to repay these obligations. As a consequence no very definite trend appears in the average of these other debt items from the heavier to the lighter soils. It is nevertheless true that similar absolute amounts of debt on heavy and light soils means a much greater proportionate burden on the latter, due to their lesser capacity for payment.

In the Lomond district the four least productive soils, fine sand, fine sandy loam, Lomond loam, and Lomond-east clay loam had smaller average total indebtedness than the Armada clay loam which produced much more consistently. However, as in the case of the Vulcan district, the most productive soil, the Sundial silt-clay loam, was in the middle group having a slightly smaller average total debt than the Lomond loam—$2,453 as compared with $2,537. This is chiefly explainable in terms of the position of the silt-clay loam. Surrounded by a very unproductive territory, credit was never extended in very generous amounts over any of the Lomond district, and the Sundial silt-clay farmers with better yields were in a more favourable position to pay off what debts they did accumulate.

As in the Vulcan district it was noticeable that the chief item which made for difference in average indebtedness between the soil belts was that of land debt. One very marked exception, however, must be mentioned. This was the case of the very large bank debt held by the average farmer in the Sundial district as compared with the others. The amount was $917 here as compared with amounts ranging from $6 on the fine sand to $322 on the Armada clay loam. One operator owing the banks a very large amount accounted for almost the total of this figure.

The inability to liquidate land obligations was of major importance in driving many farmers from the land after the great credit expansion during the war and the later retrenchment of the post-war depression in the early twenties. Of these abandonments and the indebtedness of the individuals concerned we have only an incomplete record. It would appear that the majority of them were deeply involved in debt and the final factor which drove them from their holdings was the pressure of creditors, many of whom were forced to take very great losses with the greatly depreciated prices of land.

Tenure and Indebtedness.—Some part of the variations among the operators with different sizes of holdings and on the different soil belts was explainable in terms of the type of contract by which land was held. However, the very nature of ownership and tenancy as a means of holding land is in itself an important consideration with respect to indebtedness, especially insofar as land debt is concerned. Tenants are entirely without this form of indebtedness, paying for the use of their land by share rentals in almost all cases. This means that they are less affected by changes in the value of money as it affects long-term debt contracts. The owners on the other hand, buy their land at fixed rates which they pay off usually in annual instalments. Since the large proportion of the land acquisitions and all types of land credit were made during the better years, the owners undertook to pay relatively large amounts of money for their land. During years such as 1934-35, drought conditions and low wheat prices made payments exceedingly difficult to maintain. This naturally put the owners at a disadvantage.

Table 58 presents the distribution of indebtedness according to tenure of operator. The very great difference between the tenants and the owners or part owners is striking. In Vulcan the average total debt for the owners was $6,788 as compared with only $796 for the tenants. The same general difference was evident in Lomond. The higher debt of the part owners than that of the owners is explainable partly in terms of the age difference of the two groups and the

TABLE 58.—AVERAGE DISTRIBUTION OF INDEBTEDNESS ACCORDING TO TENURE IN THE VULCAN-LOMOND AREA OF ALBERTA

Class of debt	232 farms in Vulcan district				261 farms in Lomond district			
	Owners	Part owners	Tenants	All farms	Owners	Part owners	Tenants	All farms
	$	$	$	$	$	$	$	$
Land	5,181	5,416	.....	4,148	1,275	1,860	.....	1,311
Machinery	348	550	244	397	263	487	192	348
Tax	420	461	.....	344	247	254	2	208
Relief	32	22	43	31	154	158	123	150
Bank	153	123	163	144	244	235	61	208
Other	532	431	233	432	183	300	150	229
Total farm	6,666	7,003	683	5,496	2,366	3,294	528	2,454
Total family	122	150	113	130	64	187	127	128
Total liabilities	6,788	7,153	796	5,626	2,430	3,481	655	2,582

years on the present farms. The owners were generally older, averaging 52·9 and 53·8 years of age as compared with the part owners 49·6 and 49·5 years of age, respectively. In both Vulcan and Lomond districts the part owners averaged fewer years on the farm, 18·3 years as compared with 20·5 years respectively in Vulcan and 17·6 years and 19·5 years in the Lomond district. The part owners in many cases were the younger and middle-aged men who were still acquiring land. They were naturally more heavily indebted than those who had ceased to acquire land and were working their holdings with the intention of paying off present obligations rather than taking on more. In some measure too, the part owners were holders of larger tracts of land, and therefore had greater assets to show against their liabilities.

Change in Debt Position 1934-35

It is well known that farmers generally received only a minimum of credit in the years following 1929. Much reduced prices for farm products and prevalence of depression conditions, lack of confidence, and stringent money were largely responsible for this condition. The lack of credit from 1930-35 was in direct contrast to the great expansion of the loans which occurred during the latter part of the twenties and the last years of the war. In general, farmers maintained approximately the same size of holdings as they had operated in the years of easy credit. It is not surprising then, that many of the operators were forced, through lack of ready funds to limit the intensity with which they tilled their land. In many cases, large tracts which otherwise would have been worked by thorough summer-fallow methods were either very lightly scratched over or left entirely idle.

The obligations taken on in the better years reduced still further the working capital of the operators by taking from them a certain part of their liquid funds for the payment of interest and to some extent of principal on such debts. The amount of new credit extended, and the payments made in principal and interest by the farmers in the study is shown in Table 59. The amount of interest which remained unpaid during the year (interest accrued) is also shown.

The Vulcan farm operators were able to pay back in principal $312 per farm operator as compared to $73 by the Lomond operators. A higher average payment for the Vulcan operators was expected since they were on the average more heavily indebted. The higher net income of the Vulcan operators was also important in the amount of principal and interest payment. The Vulcan farmers

on the average had operators' income of $285, while the Lomond farmers had on the average only $66 as operators' income. The higher amounts paid in principal and in interest by the Vulcan farmers was thus coincident with their higher net incomes.

TABLE 59.—AVERAGE DISTRIBUTION OF CHANGE IN DEBT POSITION IN THE VULCAN-LOMOND AREA FOR 1934-1935

—	232 farms in Vulcan district		261 farms in Lomond district	
	$	Percent of total	$	Percent of total
New credit	355	66	254	70
Accrued interest	182	34	107	30
Total new debt	537	100	361	100
Interest paid	158	47	29	21
Interest accrued	182	53	107	79
Interest payable	340	100	136	100
Principal paid	312	100	73	100

Of 212 farm operators that were indebted in the Vulcan district, 75 per cent made principal payments in order to reduce their outstanding indebtedness. In the Lomond district 93 per cent of the 148 operators who had liabilities made principal payments.

Interest payable was another indication of the relative indebtedness and extension of credit to various districts in the past. The Vulcan farmers on the average had interest payments of $340 to meet, of which 47 per cent was actually paid. The Lomond farmers on the average had interest payments of only $136 to meet, of which 21 per cent was paid.

In the Vulcan district, 84 per cent of all the farm operators interviewed had interest payments falling due during the year 1934-35 of which number only 20 per cent met their payments in full and 53 per cent partially. In the Lomond district, 89 per cent of the farm operators reported interest payable. Of this number with interest obligation, 47 per cent paid nothing, 45 per cent made partial payments and the remaining 8 per cent paid in full. Even with much smaller obligations the Lomond farmers were in a poorer position to pay than were those of Vulcan.

The total new credit which was extended to the two districts differed considerably. The Vulcan farm operators on the average were advanced $537, of which 66 per cent was new credit and 34 per cent was accrued interest on all obligations. The Lomond farmers received a somewhat lower average advance of new credit. The amount received per operator was $361, of which $254 was new credit and $107 was accrued interest, i.e. involuntary credit. A large part also of the $254 was of an involuntary nature since current taxes unpaid and relief items were included in this figure. The amount of involuntary credit was much greater than in the Vulcan district.

It is not to be inferred from the above discussion that all farmers in both districts needed or were able to secure new credit. It was not easy to secure, and many farmers because of their financial status, were unable to obtain credit although it was needed. Some, on the other hand, because of their past savings, had no need to rely on anyone to carry them, but were able to make cash payments for what was needed.

Size of Farm and Change in Debt Position.—As the size of farm increased, the amount of principal paid also increased with one or two variations.

In the Lomond district the average principal payment for the smallest farm was $57, and for the largest $933. The same tendency was noted for the Lomond farms, but it was not as uniform. Also the principal payments for the corresponding size of farm were on the average much lower than those of the Vulcan district.

The material also showed that the total new debt increased with the size of the farm. It was evident that the ability to get credit in larger amounts was associated with increase in the size of farm holding.

Table 60 shows the relation of payments in principal and interest to the total liabilities. In the Vulcan district the ratio varied little on farms of one and one-half sections or less while those over that size showed a higher proportion of payments on debt. In Lomond the trend of the ratio is inconclusive with no size grouping having paid very large proportions of the principal and interest due.

TABLE 60.—RELATION BETWEEN DEBT REDUCTION, SIZE OF FARM AND OPERATOR'S INCOME FOR THE VULCAN AND LOMOND DISTRICTS, 1934-1935

Size of farm	Vulcan district			Lomond district		
	Number of farms	Ratio of total liabilities to principal and interest paid	Operator's income	Number of farms	Ratio of total liabilities to principal and interest paid	Operator's income
			$			$
1	10	1 : 0·084	245	8	1 : 0·051	71
2	49	1 : 0·080	256	46	1 : 0·025	72
3 and 4	82	1 : 0·066	367	103	1 : 0·033	173
5 and 6	49	1 : 0·081	301	54	1 : 0·058	9
7 and 8	21	1 : 0·099	209	29	1 : 0·036	34
9 and over	21	1 : 0·112	91	21	1 : 0·045	−279
All farms	232	1 : 0·084	287	261	1 : 0·040	66

Soil and Change in Debt Position.—Soil was a factor determining which operators would be able to meet their obligations in any particular year. Tables 61 and 62 show the ratio of total indebtedness to principal and interest paid, and the soil types are ranked on this basis.

TABLE 61.—RELATION BETWEEN DEBT REDUCTION, SOIL, OPERATOR'S INCOME AND AVERAGE WHEAT YIELD IN THE VULCAN DISTRICT OF ALBERTA, 1934-1935

Soil type	Number of farms	Ratio of total debt to principal and interest paid	Operator's income	Average wheat yield 1934
			$	
Vulcan fine sandy loam	17	1 : 0·126	948	16·4
Blackspring silt loam	21	1 : 0·107	524	16·4
Vulcan silt loam	75	1 : 0·091	432	13·6
Vulcan loam	52	1 : 0·090	196	13·6
Vulcan clay loam	28	1 : 0·054	−88	8·9
Carmangay fine sand	39	1 : 0·027	−26	5·8
All farms	232	1 : 0·084	285	13·2

The ability to pay off indebtedness was closely related to operator's income on the various soil types. Although the relationship between operator's income

and the ratio of indebtedness to the amount paid off was not as closely related in the Lomond district as in the Vulcan district, still there was evidence of some relationship.

TABLE 62.—RELATION BETWEEN DEBT REDUCTION, SOIL, OPERATOR'S INCOME AND AVERAGE WHEAT YIELD IN THE LOMOND DISTRICT OF ALBERTA, 1934-1935

Soil type	Number of farms	Ratio of total debt to principal and interest paid	Operator's income	Average wheat yield 1934
			$	
Armada clay loam	46	1 : 0·054	178	10·7
Sundial silt clay loam	13	1 : 0·051	1,231	13·1
Lomond east clay loam	62	1 : 0·050	— 3	5·5
Lomond loam	97	1 : 0·026	— 55	4·6
Lomond fine sand	17	1 : 0·034	139	3·3
Lomond fine sandy loam	26	1 : 0·025	—144	2·4
All farms	261	1 : 0·040	66	6·0

Tenure and Change in Debt position.—The relation between tenure and change in debt position is shown in Table 63.

Although the tenants had the lowest debt, they made the largest proportionate payments. This was coincident with largest net earnings. Tenants, in order to maintain credit standing must be more regular in their payments than owners or part-owners who have fixed assets as security.

TABLE 63.—RELATION BETWEEN DEBT REDUCTION, TENURE, AND OPERATOR'S INCOME IN THE VULCAN-LOMOND AREA OF ALBERTA, 1934-1935

Tenure	Vulcan district			Lomond district		
	Number of farms	Ratio of total liabilities to principal and interest paid	Operator's income	Number of farms	Ratio of total liabilities to principal and interest paid	Operator's income
			$			$
Owners	100	1 : 0·063	114	102	1 : 0·032	59
Part owners	82	1 : 0·101	402	114	1 : 0·040	—10
Tenants	50	1 : 0·176	438	45	1 : 0·095	275

Reasons for Obtaining Mortgages

An endeavour was made to discover the reasons for the assumption of land debt. Table 64 summarizes the various reasons for obtaining mortgages.

The reasons given most frequently for obtaining mortgages were: assumed with purchase, consolidation or payment of short term obligations, general farm operations, and to finance the purchase of additional land. The heavy burden carried in land obligations cannot be overemphasized as a limiting factor in financial progress.

TABLE 64.—REASONS FOR OBTAINING MORTGAGES IN THE VULCAN-LOMOND AREA OF ALBERTA

Reasons	Vulcan district		Lomond district	
	Number of operators giving specific reason	Percentage	Number of operators giving specific reason	Percentage
1. Assumed with legacy	7	5	2	3
2. Assumed with purchase	27	18	10	15
3. Pay off indebtedness	47	31	13	19
4. General farm operations	24	16	26	39
5. Building	7	4	1	2
6. Equipment	10	6	2	3
7. Land purchase	16	10	7	10
8. Miscellaneous	1	1	.....	.....
9. Secure loam	1	1	2	3
10. Health	.....	.....	2	3
11. Unknown	12	8	2	3
Total	152	100	67	100

NET WORTH

The previous section has presented a picture of the indebtedness of the operators at the time of the study. An earlier part of the report summarized the position of the farm assets. It now remains to discuss the final net worth of the farmers. This is the composite index of the success of operation. The financial progress will be indicated as a measure of the farm operation by consideration of the relation between net worth at the beginning of operations on the farm and at the time of the study.

It has already been pointed out that great differences were discovered in the types of farming, the productivity of the soil and the net returns of various farmers. These will be given further consideration.

Table 65 summarizes the beginning net worth of farm operators in both the Vulcan and Lomond districts. In the Vulcan district 27 per cent of the farm operators brought $500 or less with them as compared with 37 per cent for Lomond operators. None of the operators commenced farming with more than $15,000 in the Lomond district, while 15 operators in the Vulcan district had over $15,000 as initial capital for their farming operations. In general, the Vulcan operators had more cash to begin with than those of the Lomond district. The range of beginning net worth for the Vulcan operators was from zero to $33,000, while the range for Lomond was from no initial capital to $11,370.

Most of the settlers of the Vulcan district owned and farmed in the United States before coming to settle in the Vulcan district, and consequently had built up quite an equity in live stock, machinery and feed and seed as well as ready cash, which is included at estimated value in the table.

Change in Net Worth

Table 66 summarizes the average yearly gain by districts. A few (10 per cent) of the operators had less than $1,000 average yearly gain in the Vulcan district as compared with 3 per cent in the Lomond district. Twenty-one per cent had $501 or over as an average yearly gain for the Lomond district. On the whole the Vulcan farm operators experienced greater individual losses as well as greater individual gains over the years than the Lomond operators. This is of some importance as the very high gains and very high losses over the years in Vulcan were explainable largely in terms of the great changes in land

TABLE 65.—NET WORTH OF FARM OPERATORS WHEN THEY STARTED FARMING IN THE VULCAN AND LOMOND DISTRICTS

Net worth at start	Vulcan district		Lomond district	
	Number of operators	Cumulative percentage	Number of operators	Cumulative percentage
$				
0– 500	62	27	97	37
501– 1,000	30	40	43	54
1,001– 1,500	18	48	28	65
1,501– 2,000	19	56	22	73
2,001– 2,500	12	61	11	77
2,501– 3,000	10	65	8	80
3,001– 3,500	5	68	9	84
3,501– 4,000	5	70	9	87
4,001– 4,500	4	72	4	89
4,501– 5,000	5	74	5	91
5,001– 5,500	7	77	2	92
5,501– 6,000	4	78	8	95
6,001– 6,500	2	79	3	96
6,501– 7,000	3	81	2	97
7,001– 7,500	5	83	1	97
7,501– 8,000	4	85	1	97
8,001– 8,500	1	85	3	99
8,501– 9,000	1	85	1	99
9,001–10,000	7	88	2	100
10,001–15,000	12	94	1	100
15,001–20,000	3	95	.....	.....
20,001 and over	12	100	.....	.....
	231[1]	.....	260[1]	.....

[1] One farmer in each district gave no information.

values and the amount of debt which was carried. Where farmers acquired large parcels of land in periods of high prices, they usually assumed large agreements of sale; some, too, assumed very heavy mortgages during prosperous times. When low prices and low yields occurred, the money value of the property declined rapidly without any similar decrease in the money value of

TABLE 66.—DISTRIBUTION OF AVERAGE YEARLY GAIN IN NET WORTH FOR VULCAN AND LOMOND FARM OPERATORS IN ALBERTA, 1900-1935

Average yearly gain	Vulcan district		Lomond district	
	Number	Cumulative percentage	Number	Cumulative percentage
Less than $—1,001	23	10	8	3
—$1,000— —501	19	18	14	9
—500— —251	11	23	18	15
—250— —126	14	29	23	24
—125— — 76	9	33	10	28
— 75— — 26	17	40	13	33
— 25— — 1	8	44	10	37
0— 25	9	48	9	40
26— 75	16	55	21	48
76— 125	12	60	27	59
126— 250	17	67	48	77
251— 500	26	79	34	90
501— 1,000	34	93	13	95
1,001 and over	16	100	12	100
	231	.....	260	.....

the liabilities. This, then, explains the low average yearly gains: decrease in the value of assets with no decrease in the amount of the liabilities.

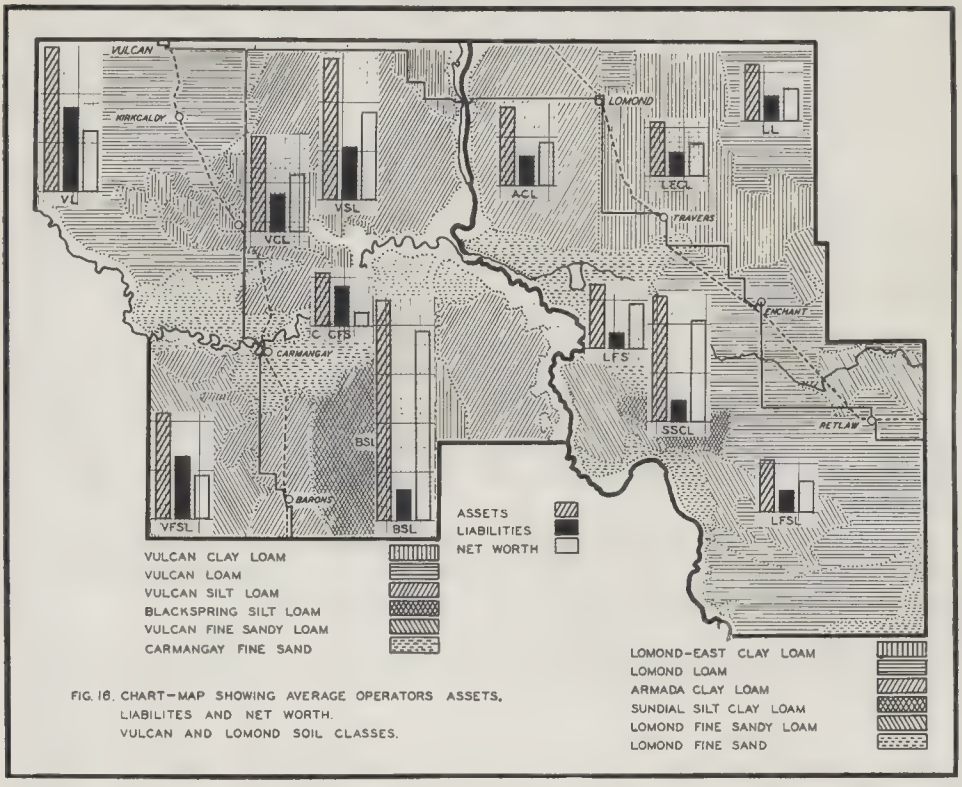

FIG. 18. CHART-MAP SHOWING AVERAGE OPERATORS ASSETS, LIABILITES AND NET WORTH. VULCAN AND LOMOND SOIL CLASSES.

Size of Farm and Change in Net Worth.—In general, those farmers operating small units at the time of the survey, began farming with less net worth than those on larger units (Tables 67 and 68). It is also true that the difference in final net worth was very great between the operators on the quarter section as compared with those on units of two sections or more. The final net worth of the former group averaged $2,131 and the latter $19,206 per operator in the Vulcan district and $474 and $8,288 respectively in the Lomond district. The ratio of net worth at start to final net worth, shown in Tables 67 and 68, bring out clearly the long run advantage of the larger farm in these areas.

TABLE 67.—RATIO OF NET WORTH AT START TO FINAL NET WORTH IN THE VULCAN DISTRICT OF ALBERTA, 1900–1935, ACCORDING TO SIZE OF FARM

Number of quarters	Number of farms	Net worth at start	Net worth 1935	Ratio of net worth at start to net worth 1935
		$	$	
1	10	1,133	2,131	1 : 1·88
2	49	4,030	3,811	1 : 0·94
3 and 4	81	4,013	5,211	1 : 1·29
5 and 6	49	5,123	8,490	1 : 1·65
7 and 8	21	5,059	13,108	1 : 2·59
9 and over	21	5,482	19,206	1 : 3·50
All farms	231	4,313	7,425	1 : 1·70

TABLE 68.—RATIO OF NET WORTH AT START TO FINAL NET WORTH IN THE LOMOND DISTRICT OF ALBERTA, 1900–1935, ACCORDING TO SIZE OF FARM

Number of quarters	Number of farms	Net worth at start	Net worth 1935	Ratio of net worth at start to net worth 1935
		$	$	
1	8	514	474	1 : 0·92
2	45	1,525	1,527	1 : 1·00
3 and 4	103	1,879	3,391	1 : 1·80
5 and 6	54	1,713	4,476	1 : 2·61
7 and 8	29	5,119	6,757	1 : 1·31
9 and over	21	1,725	8,288	1 : 4·80
All farms	260	1,743	3,974	1 : 2·28

In the discussion of net farm returns for the crop year 1934-35 it was pointed out that the larger farmers were not able to show much greater operator's income than the smaller ones. However, the longer time index of financial progress points significantly to more adequate returns to the larger units when all years are considered.

Soil and Change in Net Worth.—Soil productivity was certainly a major factor influencing the net worth of farm operators. The following table summarizes the change in net worth by soil types. (Figure 16).

TABLE 69.—RATIO OF NET WORTH AT START TO FINAL NET WORTH IN THE VULCAN DISTRICT OF ALBERTA, 1900–1935, ACCORDING TO SOIL TYPE

Soil type	Number of farms	Net worth at start	Net worth 1935	Ratio of net worth at start to net worth 1935
		$	$	
Blackspring silt loam	21	1,533	19,450	1 : 12·69
Vulcan silt loam	75	4,341	9,099	1 : 2·10
Vulcan clay loam	28	3,868	5,927	1 : 1·53
Vulcan fine sandy loam	17	3,371	4,501	1 : 1·34
Carmangay fine sand	38	2,318	1,509	1 : 0·65
Vulcan loam	52	11,225	6,241	1 : 0·56
All farms	231	4,313	7,425	1 : 1·70

TABLE 70.—RATIO OF NET WORTH AT START TO FINAL NET WORTH IN THE LOMOND DISTRICT OF ALBERTA, 1900–1935, ACCORDING TO SIZE OF FARM

Soil type	Number of farms	Net worth at start	Net worth 1935	Ratio of net worth at start to present net worth
		$	$	
Sundial silt clay loam	13	2,508	10,453	1 : 4·17
Armada clay loam	46	1,578	4,419	1 : 2·80
Lomond fine sand	16	1,844	5,086	1 : 2·76
Lomond east clay loam	62	1,337	3,315	1 : 2·48
Lomond loam	97	1,728	3,339	1 : 1·93
Lomond fine sandy loam	26	2,615	3,202	1 : 1·22
All farms	260	1,743	3,974	1 : 2·28

The Blackspring silt loam in the Vulcan district showed the greatest gain over the years. The ratio of net worth at start to net worth in 1935 was 1:12·69. Vulcan loam showed a heavy loss, the ratio of net worth at start to present net worth in 1935 being 1:0·56. The great loss was due to a large depreciation in land values, unusual hail storms and drought. Land on this soil type was sold at a higher price than on any other soil type. The low ratio of the Carmangay fine sand on the other hand was partly due to change in land values, and the low productivity of the soil.

In the Lomond district the Sundial silt clay loam had the best showing, the ratio of net worth at start to net worth in 1935 being 1:4·17. The relatively high position of the Lomond fine sand was related to the large net earnings of farmers during some of the years prior to 1935. Farmers on this soil reported that the yield in 1915 and 1916 was as high as 56 bushels to the acre. Some of the operators successfully carried on a semi-ranching system on the adjacent cheap lands. One operator also reported a large legacy. This, coupled with the small sample, helped to explain in part why such a high increase in net worth was shown for this soil type.

Tenure and Change in Net Worth.—The net returns to tenants for the crop year 1934-35 under extremely dry conditions and low prices showed up quite favorably as compared with the owners and part owners. In contrast with this single year index the financial progress over the years gives a very different picture. In both Vulcan and Lomond districts those farmers who were tenants at the time of the survey had commenced farming operations with much less initial capital than those who were owners or part owners. In both districts the tenants were worth less at the time of the survey than when they had commenced operations on their farms. With the owners and part owners significant additions were made to their initial capital so that in 1935 both of these groups showed much greater progress financially than the tenants.

TABLE 71.—RATIO OF NET WORTH AT START TO FINAL NET WORTH IN THE VULCAN DISTRICT OF ALBERTA, 1900–1935, ACCORDING TO TENURE

Tenure	Number of farms	Net worth at start	Net worth 1935	Ratio of net worth at start to net worth 1935
		$	$	
Owners	100	4,452	8,100	1 : 1·81
Part owners	81	5,303	9,868	1 : 1·86
Tenants	50	2,213	1,900	1 : 0·85
All farms	231	4,313	7,425	1 : 1·70

TABLE 72.—RATIO OF NET WORTH AT START TO FINAL NET WORTH IN THE LOMOND DISTRICT OF ALBERTA, 1900–1935, ACCORDING TO TENURE

Tenure	Number of farms	Net worth at start	Net worth 1935	Ratio of net worth at start to net worth 1935
		$	$	
Owners	101	2,062	5,385	1 : 2·61
Part owners	114	1,123	3,481	1 : 3·09
Tenants	45	984	655	1 : 0·66
All farms	260	1,743	3,974	1 : 2·28

Years on the Farm and Change in Net Worth.—The change in net worth according to years on the farm is shown in Tables 73 and 74. The farm operators who had been on their farms the longest made on the average, greater gains. In other words, the risk of wide fluctuations in price and yields were reduced when taken on a long-time average.

TABLE 73.—FINANCIAL PROGRESS ACCORDING TO YEARS ON THE FARM IN THE VULCAN DISTRICT OF ALBERTA, 1900–1935

Years on the farm	Number of farms	Net worth at start	Present net worth	Ratio of net worth at start to present net worth
		$	$	
0– 4	37	1,713	1,382	1 : 0·81
5– 9	46	5,276	2,741	1 : 0·52
10–14	24	15,808	5,155	1 : 0·33
15–19	28	7,139	9,335	1 : 1·31
20–24	21	2,589	13,360	1 : 5·16
25–29	37	2,456	10,297	1 : 4·19
30 and over	39	1,759	14,405	1 : 8·19
All farms	232	5,174	7,425	1 : 1·44

TABLE 74.—FINANCIAL PROGRESS ACCORDING TO YEARS ON THE FARM IN THE LOMOND DISTRICT OF ALBERTA, 1900–1935

Years on the farm	Number of farms	Net worth at start	Present net worth	Ratio of net worth at start to present net worth
		$	$	
0– 4	34	1,268	1,278	1 : 1·00
5– 9	62	2,279	1,432	1 : 0·63
10–14	27	1,944	1,885	1 : 0·97
15–19	19	3,168	6,083	1 : 1·92
20–24	18	1,100	3,805	1 : 3·45
25 and over	100	1,363	6,661	1 : 4·89
All farms	260	1,743	3,974	1 : 2·28

The farm operators who had 14 years or less on their farm showed a decrease in their net worth. On the other hand, those that had been 15 years or over on their farm increased their net worth.

Final Net Worth of Farm Operators in 1935.—Table 75 summarizes the final net worth in 1935 of the operators by districts.

Negative net worths were reported by 21 per cent of the operators in the Vulcan as compared with 20 per cent in the Lomond district. On the other hand, 13 per cent of the operators in the former district had net worths over $20,000, while only 3 per cent of the operators of the latter district were in the same class. The wide fluctuations in the net worth of farm operators in the Vulcan district can be attributed largely to the change in land values. The farms were also classified according to soil type and net worth. None of the farmers on the Blackspring silt loam reported negative net worth, while 17, or 44 per cent of the total number interviewed on the Carmangay fine sand reported negative net worths. The higher percentage (27 per cent) of farm operators

with negative net worths on the Vulcan loam was due mainly to great changes in land values.

In the Lomond district, 30 per cent of the operators on the Armada clay loam reported negative net worths. Only one operator had a negative net worth on the Sundial silt clay loam.

TABLE 75.—FREQUENCY DISTRIBUTION OF NET WORTH OF FARM OPERATORS IN THE VULCAN AND LOMOND DISTRICTS OF ALBERTA, 1935

Net worth—groups	Vulcan district			Lomond district		
	Number of farms	Percentage	Cumulative percentage	Number of farms	Percentage	Cumulative percentage
Under -$—10,000	1					
— $9,999— — 5,000	7	3	3	8	3	3
— 4,999— 0,000	40	17	21	44	17	20
0,001— 5,000	81	35	56	131	50	70
5,001— 10,000	40	17	73	52	20	90
10,001— 20,000	35	14	87	18	7	97
20,001 and over	30	13	100	8	3	100
	232	100		261	100	

It is evident from these figures that the more productive soils were more remunerative over the years than the least productive, as shown by the net worth figures. Exceptions were noted which were not due to the productivity of soil, but due to high purchase price of land.

THE FUTURE OF LAND USE IN THE VULCAN-LOMOND AREA

This report has portrayed the use of land on the basis of intensity. It is the method which seemed to lend itself most aptly to the definition of the type of agriculture in its changing aspects, and to point to future changes. Emphasis has been placed on the fact that much of the difficulty experienced by farmers in the area studied was due to over- or under-intensity of farming practices. It is the application of capital, labour and management to the land unit that is of interest.

When the rancher utilized these districts, the animals moved over a tremendous area adjusting their positions to the produce of the soil according to the local condition of the grass and water supply. However, with the entrance of the settler came the definite allocation of small land parcels and the cessation of the movement of capital and labour. Land took on position and fertility value with the result that each operator had a stake in a particular parcel and was required to adjust his capital, labour, and management to that particular unit. Only within restricted limits could he change the extent of his land holdings. In order to add to his holdings he was forced to purchase or rent. During the first few years of settlement the predominant farm was one of 320 acres. This was typical of all districts until the high prices of the war period eight or ten years after first settlement encouraged some to buy out adjoining farmers. Up to this time virgin land was still being broken and the variation in productivity between soil belts was relatively small. Intensity of use remained quite similar: as the size of the farm increased so also did the amount of capital and labour. However, a period of low precipitation and low prices occurred after the war which brought to light the great differences between the various soil and precipitation belts.

This was the real beginning of the drought area problem. Farmers in the driest areas found themselves cultivating their land with the same degree of intensity as those in the more favoured locations. It was discovered that the lighter soils could not carry the same amount of machinery and livestock and produce similar net returns. In some areas, such as that east of the town of Lomond, it was found impracticable to continue regular farming operations at all and the first period of abandonment occurred. A small number of the original settlers continued to operate their holdings and acquired adjoining property by purchase at very low rates, usually for the tax arrears, or by renting. This was the beginning of very extensive agriculture on the lighter soils. Most of it remained in an idle state until moisture and price conditions became favourable. In the years between 1926 and 1928, a period again occurred of adequate moisture and favourable price. The productivity of light and heavy soils was comparatively similar and applications of capital and labour again approached equality. It was a time of rapid acquisition of machinery, especially of large-scale power units such as the tractor and combine.

Relatively similar intensity of land use on all soil belts except those which had been largely abandoned again brought in its wake a serious problem for those on the lighter soils when the return of low precipitation and low prices occurred following 1929. Then came another period of abandonment and readjustment to a system of farming determined by the limitations of productivity. The lighter soils and those most subject to periods of low precipitation were again found to be unable to support the same intensity of farming practices. Readjustments occurred up to the period of the study which indicate the possible future trends in the use of land. These readjustments have already been mentioned. They include the return to a semi-farming, semi-ranching system of agriculture in the lightest soil classes such as those of the fine sand, and in the areas of least average precipitation such as those on the north-eastern section of the Lomond district. Many farmers in the poorer soil classes left large parts of their holdings idle and utilized only the least eroded sections. In all likelihood, on the lighter soil belts the operators will continue to extend the size of their holdings and to use only a limited amount of capital and labour per acre.

Adjustment in intensity of use will likely be retarded in the lighter soil and precipitation belts to the extent that farmers judge relative productivity of their soil by the better years. It has been this type of judgment which has contributed largely to the unsuccessful use of much of the poorer soil classes. In many areas the land will be allowed to return to range. Regrassing is a means of speeding up this process. In the meantime it is likely that most districts will hold a number of farmers who will probably continue to use wheat as one of their sources of income but who will more and more be required to diversify through range livestock, in order to establish the farming business on an economic basis of secure rather than speculative returns.

In the foregoing discussion of the changing pattern of intensity of use and possible future trends mention was made at one point of the land taking on fertility and position value after the time of the first homestead settlement. Throughout the study reference has been made to the importance of the cost of land as a differential factor in financial progress and net returns of farmers. Little differentiation was noticeable in land cost until a few years after the first settlement. With the coming of the railroads and the establishment of towns, naturally some lands became more valuable because of their position with respect to these facilities. Apart from this differentiation in land costs or values, little change occurred except in a general increase. However, as the productivity of the land became better known, especially through the experience of very low yields on the lighter soils, the factor of varying productivity entered to change land values. Evidence has been presented in the section on land acquisition and that on financial progress to show that average values of land were relatively

similar in the first fifteen years of settlement. However, since that time the lighter soils have changed hands at much lower rates and the share rentals for these lighter lands are also based on a smaller percentage of the crop. Through this means a gradual adjustment of net returns seems to have occurred. With reduced costs of land, or rent, the operator on the lighter soils was able to show a much better return on his investment and for his labour and managerial skill with the lower rent than that which obtained on the heavier soils. Just as the intensity of land use varied with the vagaries of climate and price of wheat, so also did the price of land. Farmers, in many cases, bought their land at times when its price was high. They therefore carried an extra burden when the periods of low yields and low prices occurred. If the price of land can be maintained at a level dependent upon the average productivity of the soil, the net returns to farming from one district to another will be much more equally distributed and the mortgage and agreement of sale problem will become much less significant. The extended period of drought and low prices following 1929 impressed farmers and credit agencies with the lowness of net returns which can occur. In the future it is unlikely that any periods of such over-expansion as that of 1927-28 will recur. No doubt the arid zone will again experience prosperous years but it must be recognized, at least more than has previously been the case, that lean years will come also.

APPENDIX A

TOWNSHIPS INCLUDED IN THE 1935 ECONOMIC SURVEY OF THE VULCAN AND LOMOND DISTRICTS, ALBERTA, CANADA

VULCAN DISTRICT

Township	Range	Township	Range	Township	Range
13	21	17	23	15	25
14	21	12	24	16	25
17	22	13	24	17	25
12	23	14	24	12	22
13	23	15	24	13	22
14	23	16	24	14	22
15	23	17	24	15	22
16	23	14	25	16	22

LOMOND DISTRICT

Township	Range	Township	Range	Township	Range
11	17	17	18	13	20
12	17	18	18	14	20
13	17	13	19	15	20
12	18	14	19	16	20
13	18	15	19	17	20
14	18	16	19	15	21
15	18	17	19	16	21
16	18	.....	.....	17	21

APPENDIX B

DEFINITION OF TERMS

Abandoned Farms.—Due to the fact that farms are not always abandoned as a unit since neighbours often acquire certain parcels when the original operator leaves, the term cannot be given specific definition. However, the term applies to the farmstead and parcel on which it is located in conjunction with the surrounding parcels previously operated as a unit but not held under any contract nor fenced in 1935, although they may be incidentally used for grazing by neighboring farmers.

Capital and Investment: Reduction of Inventory.—In the preparation of material showing the cash income and outgo during the crop year certain items fall into the capital or investment classification. These include purchase of machinery, breeding stock, land and the like. At the same time a part of the cash income comprises sales of the same items. In this study the capital and investment items were combined with the change in cash position and debt position of the operator to give a net figure for each farm. This net figure is termed *reduction of inventory* when more capital is sold off or bank balance reduced or debt increased. When the net figure is positive, i.e. when a net investment is made, the term used is *capital and investment.*

Net Returns.—There are a number of ways of measuring net returns, each one suitable for a different aspect of a complex problem. In this study the term *operator's income* has been used to apply to the residue of earnings which remains after all annual expenses of production are paid. These expenses of production include wages of labour[1], depreciation[2] and repairs, interest on capital[3], and all of the cash costs of such items as threshing, feed and seed, and the like. *Revenue* included cash receipts for the year's production and the farm privileges credited to the living of the family and the labour in the form of farm products and rent for the house.[4]

Profit[5] is another index of net returns which has been used. This differs from operator's income only in that the operator's estimate of wages for himself are substracted to give a figure which parallels closely the definition of profits as used in urban business.

The profit figure has been used sparingly in this report because of the limited use of this type of net return index in other studies. The operator's income, which is very similar to that of labour earnings in many farm management studies, has been used more often because of its current acceptance and the possibility of comparison with other studies.

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[1] Includes cash wages to hired help, operator's estimate of wages for the members of the family, especially himself, who participated in farm work, and a computation of the cash and non-cash costs for board.

[2] Rates of depreciation used were as follows: general farm machinery 7 per cent, buildings 4 per cent, combine and tractor 11 per cent, car and truck 15 per cent.

[3] Actual interest payable on indebtedness plus 5 per cent computed on the operator's equity in the farm.

[4] Farm privileges estimated by the farmer according to the saving in living expenses. House rent calculated at 10 per cent of the house valuation.

[5] In a study by the Farm Economics Branch, Department of Agriculture, Cambridge University, England, an economic survey of "Agriculture in the Eastern Counties of England" the term *profit surplus* is used in a parallel manner. The definition as given in the Cambridge study is as follows: "Profit surplus is the farm income less an allowance for the occupier's own labour and less interest at 5 per cent on the farm capital. Where the profit surplus is a minus figure (i.e. deficit) it represents the amount by which the farm has failed to make a fair return for the capital investment and for the work of the occupier. Where the profit surplus is a plus figure it represents the amount left over after all legitimate charges have been met." (Page 5).

APPENDIX C

TABLE 1.—ANNUAL YIELD OF WHEAT PER ACRE IN THE VULCAN AND LOMOND DISTRICTS OF ALBERTA, 1906–1934

Year	Vulcan district		Lomond district	
	Number of farmers giving estimates	Average wheat yield per acre	Number of farmers giving estimates	Average wheat yield per acre
1906	4	36·5	.....	.....
1907	10	30·4	.....	.....
1908	10	28·9	2	24·0
1909	14	23·5	8	22·5
1910	24	3·2	29	0·6
1911	21	25·6	32	21·7
1912	20	23·3	36	20·0
1913	19	21·7	35	17·6
1914	21	15·4	34	5·2
1915	39	43·4	55	44·3
1916	41	35·6	46	38·7
1917	40	24·1	39	20·2
1918	41	12·7	40	6·8
1919	41	4·5	41	1·2
1920	41	16·2	34	11·9
1921	33	11·4	30	5·8
1922	30	12·8	33	8·0
1923	51	33·0	53	26·5
1924	40	17·6	36	8·7
1925	52	18·8	40	10·0
1926	54	22·6	42	13·7
1927	59	28·4	67	36·5
1928	66	30·2	72	31·0
1929	66	18·0	60	13·8
1930	70	16·3	69	9·9
1931	60	12·5	66	6·9
1932	73	16·3	70	10·3
1933	72	12·1	69	8·1
1934	232	12·2	261	6·0
Average yield 1906–1934	.....	19·9	.....	15·9

TABLE 2.—AVERAGE DISTRIBUTION OF SOURCES OF CASH REVENUE ACCORDING TO SOIL TYPE IN THE VULCAN DISTRICT OF ALBERTA, 1934–1935

Soil type	Number of farms	Cash farm receipts					Cash non-farm receipts	Reduction of inventory	Total cash revenue
		Crop sales	Live stock sales	Farm produce sales	Other	Total			
		$	$	$	$	$	$	$	$
Blackspring silt loam	21	2,553	135	40	98	2,826	140	400	3,366
Vulcan fine sandy loam	17	2,434	205	45	116	2,800	96	174	3,070
Vulcan silt loam	75	2,197	192	43	98	2,530	92	412	3,034
Vulcan loam	52	2,017	163	50	151	2,381	87	578	3,046
Vulcan clay loam	28	1,105	198	110	101	1,514	113	342	1,969
Carmangay fine sand	39	509	192	53	80	834	130	364	1,326
All farms	232	1,791	182	54	108	2,135	105	414	2,654

TABLE 3.—AVERAGE DISTRIBUTION OF SOURCES OF CASH REVENUE ACCORDING TO SOIL TYPE IN THE LOMOND DISTRICT OF ALBERTA, 1934-1935

Soil type	Number of farms	Cash farm receipts					Cash non-farm receipts	Reduction of inventory	Total cash revenue
		Crop sales	Live stock sales	Farm produce sales	Other	Total			
		$	$	$	$	$	$	$	$
Sundial silt clay loam	13	1,736	93	35	152	2,016	161	687	2,864
Armada clay loam	46	1,208	111	50	133	1,502	107	357	1,966
East clay loam	62	528	66	37	78	709	118	323	1,150
Lomond loam	97	437	71	29	121	658	178	371	1,207
Lomond fine sandy loam	26	232	106	48	64	450	184	382	1,016
Lomond fine sand	17	201	153	117	8	479	306	285	1,070
All farms	261	623	87	42	102	854	159	369	1,382

TABLE 4.—AVERAGE DISTRIBUTION OF FARM EXPENSES ACCORDING TO SOIL TYPE IN THE VULCAN DISTRICT OF ALBERTA, 1934-1935

Item	1 Black-spring silt loam	2 Vulcan fine sandy loam	3 Vulcan silt loam	4 Vulcan loam	5 Vulcan clay loam	6 Car-mangay fine sand	All Vulcan	
	$	$	$	$	$	$	$	%
Rent	231	289	340	346	227	84	271	19
Paid labour	250	94	202	149	123	81	157	11
Board of paid labour	61	30	46	44	28	21	39	3
Hired field work	25	16	11	9	11	8	12	1
Cleaning seed	*	*	2	2	*	*	1	*
Seed purchased	20	10	35	24	45	50	33	2
Formalin	2	2	2	2	2	1	2	*
Feed purchased	6	22	20	18	28	10	18	1
Feed grinding	1	1	3	3	2	1	3	*
Equipment repairs	70	28	43	29	34	17	36	3
Binder twine	34	26	35	27	26	15	28	2
Tractor costs	287	199	220	223	140	70	190	13
Hired threshing	111	140	88	101	69	55	89	6
Board of crew	2	*	18	9	21	7	12	1
Separator costs	8	2	26	5	3	5	12	1
Combine Costs	35	97	98	75	63	27	71	5
Auto	74	48	41	44	29	21	40	3
Truck costs	63	39	61	52	46	12	48	3
Hauling—hired	11	23	22	21	10	4	17	1
Other gas, oil	4	5	10	8	7	5	8	1
Blacksmith	9	8	11	14	16	4	11	1
Building repairs	29	8	12	8	6	2	10	1
Paint and painting	4	12	2	5	1	1	3	*
Fencing repairs	10	17	10	8	11	7	10	1
Pasturing stock	4	2	4	4	1	5	3	*
Rent of pasture	*	1	4	*	7	3	3	*
Small hardware	16	10	10	11	17	6	11	1
Breaking fees	1	*	2	2	4	2	2	*
Hail insurance	5	9	2	4	*	*	3	*
Taxes on real estate,	13	7	6	6	4	1	1	*
Taxes on real estate	211	130	136	187	101	65	138	9
Telephone	6	4	5	5	2	2	4	*
Veterinary medicine	1	1	2	2	3	1	2	*
Salt, etc	4	3	6	5	5	5	5	*
Spray, etc	2	1	1	1	1	1	1	*
Miscellaneous	13	1	11	2	1	2	6	*
Other turnover live stock	4	8	8	9	7	26	11	1
Total cash expenses	1,626	1,293	1,555	1,464	1,101	627	1,311	90
Unpaid labour	160	132	85	107	129	100	108	7
Board of Paid labour	90	28	20	26	29	26	30	2
1933 feed	*	1	3	15	20	6	8	1
Total farm expense	1,878	1,454	1,663	1,612	1,279	759	1,457	100

* Less than 0·5 per cent.

TABLE 5.—AVERAGE DISTRIBUTION OF FARM EXPENSES ACCORDING TO SOIL TYPE IN THE LOMOND DISTRICT OF ALBERTA, 1934-1935

Item	1 Sundial silt clay loam	2 Armada clay loam	3 Lomond-east clay loam	4 Lomond loam	5 Lomond fine sandy loam	6 Lomond fine sand	All Lomond	
	$	$	$	$	$	$	$	%
Rent	75	165	49	37	9	13	60	8
Paid labour	49	77	60	66	78	62	67	9
Board of paid labour	10	27	12	22	18	11	19	3
Hired field work	20	11	10	7	14	3	9	1
Cleaning seed	.....	*	*	.....	.....	*	*	*
Seed purchased	18	28	23	31	43	25	29	4
Formalin	3	2	1	1	1	1	1	*
Feed purchased	10	20	31	49	57	32	37	5
Feed grinding	2	2	*	1	1	.....	1	*
Equipment repairs	15	36	21	24	19	13	24	3
Binder twine	19	18	12	5	4	4	9	1
Tractor costs	157	138	99	76	51	22	91	12
Hired threshing	128	79	46	36	25	26	49	7
Board of crew	2	4	3	4	2	.....	3	*
Separator costs	.....	1	2	2	.....	.....	1	*
Combine costs	104	76	40	38	25	18	46	6
Auto	50	28	21	23	17	51	26	3
Truck costs	64	49	10	18	15	9	23	3
Hauling hired	18	10	6	4	.....	2	6	1
Other gas, oil	10	7	5	4	4	2	5	1
Blacksmith	13	12	10	8	7	4	9	1
Building repairs	*	7	2	7	2	4	5	1
Paint and painting	.....	1	*	1	*	1	1	*
Fencing repairs	7	10	6	10	5	11	8	1
Pasturing stock	*	*	*	2	3	17	2	*
Rent of pasture	4	5	5	3	7	26	6	1
Small hardware	10	13	6	6	5	6	7	1
Breeding fees	1	3	2	1	3	*	2	*
Hail insurance	.....	.....	.....	2	.....	.....	1	*
Fire insurance	7	2	2	1	2	*	1	*
Taxes on real estate	104	107	77	76	68	67	82	11
Telephone	2	*	*	1	1	1	1	*
Veterinary medicine	*	1	1	1	1	1	1	*
Salt, etc	16	5	3	5	4	8	5	1
Spray, etc	2	1	*	1	1	1	1	*
Miscellaneous	3	2	2	1	2	7	2	*
Other turnover live stock	11	8	4	2	11	2	5	1
Total cash expense	934	955	571	576	505	450	645	85
Unpaid labour	80	84	80	99	74	42	84	11
Board of paid labour	36	27	22	25	26	21	25	3
1933 feed	.....	2	7	4	3	18	5	1
Total farm expenses	1,050	1,068	680	704	608	531	759	100

* Less than 0·5 per cent.

TABLE 6.—AVERAGE DISTRIBUTION OF TOTAL REVENUE AND TOTAL EXPENDITURES TO SHOW OPERATOR'S INCOME ACCORDING TO SOIL TYPE, VULCAN DISTRICT, 1934-1935

Soil type	Blackspring silt loam	Vulcan fine sandy loam	Vulcan silt loam	Vulcan loam	Vulcan clay loam	Carmangay fine sand	All farms
	$	$	$	$	$	$	$
Total cash receipts	2,966	2,896	2,622	2,468	1,627	964	2,240
Grain increase	211	98	152	135	18	17	111
Farm contributions to labour	198	114	155	127	116	113	138
Total revenue	3,375	3,108	2,929	2,730	1,761	1,094	2,489
Farm expenses	1,877	1,454	1,663	1,612	1,279	759	1,457
Depreciation	337	225	282	271	197	131	244
Interest	795	577	701	787	481	334	632
Credit to family	158	96	149	136	108	104	131
Net expense of production	2,851	2,160	2,497	2,534	1,849	1,120	2,202
Operator's income	524	948	432	196	− 88	− 26	287
Estimated operator's wages	500	447	515	497	495	411	485
Profit	24	501	− 83	−301	−583	−437	−198

TABLE 7.—AVERAGE DISTRIBUTION OF TOTAL REVENUE AND TOTAL EXPENDITURES TO SHOW OPERATOR'S INCOME ACCORDING TO SOIL TYPE, LOMOND DISTRICT, 1934-1935

Soil type	Sundial silt clay loam	Armada clay loam	Lomond-east clay loam	Lomond loam	Lomond fine sandy loam	Lomond fine sand	All farms
	$	$	$	$	$	$	$
Total cash receipts	2,177	1,609	827	836	634	785	1,013
Grain increase	556	14	55	35	7	11	58
Farm contributions to labour	134	102	85	89	112	77	94
Total revenue	2,867	1,725	967	960	753	873	1,165
Farm expenses	1,051	1,068	680	704	608	532	759
Depreciation	235	176	136	151	148	112	153
Interest	494	404	244	269	241	211	292
Credit to family	144	101	90	109	100	121	105
Net expense of production	1,636	1,547	970	1,015	897	734	1,099
Operator's income	1,231	178	− 3	− 55	−144	139	66
Estimated operator's wages	519	484	396	408	529	379	434
Profit	712	−306	−399	−463	−673	−240	−368